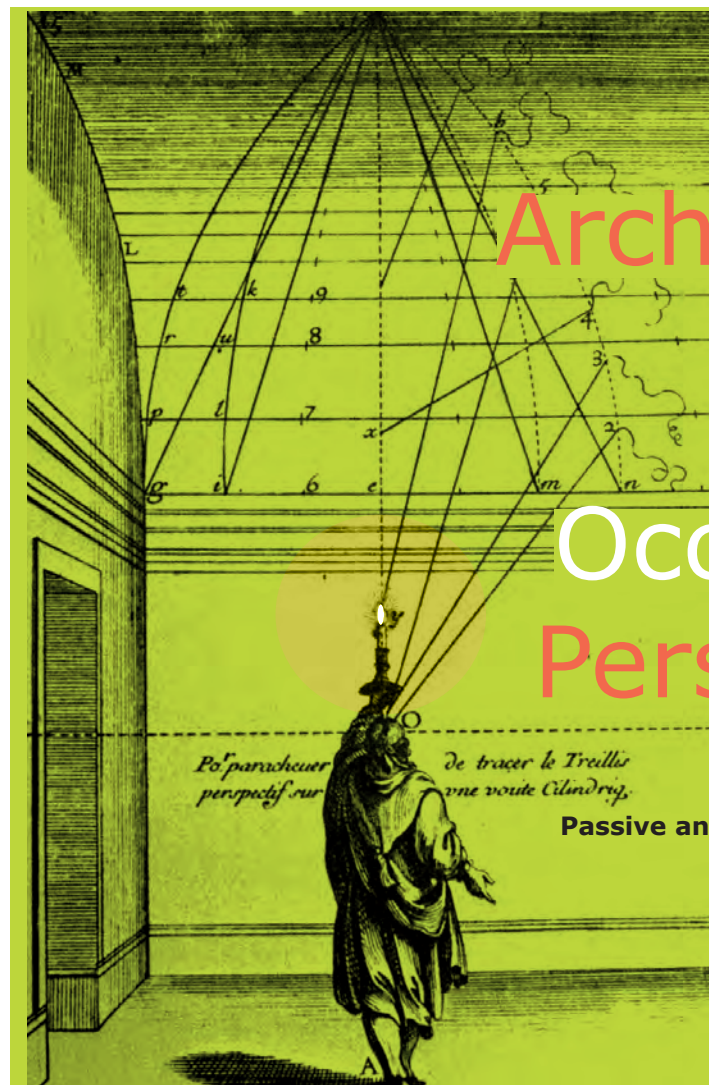




Court intérieure, École d'architecture, Vieux Séminaire de Québec.
Photo: Victor Rodrigue, M.Sc. D.U.

PLEA 2009



**Architecture
Energy
and the
Occupant's
Perspective**

22-24 June
Passive and Low Energy Architecture
Groupe de Recherche
en ambiances physiques

 UNIVERSITÉ
LAVAL
Faculté d'aménagement,
d'architecture
et des arts visuels
École d'architecture

Québec Canada

The 26th international conference on Passive and Low Energy Architecture (PLEA) would like to thank its partners for supporting this event.

Main Partners



Avec la participation de :
• Agence de l'efficacité énergétique
• Société immobilière du Québec



lemay associés [architecture, design]
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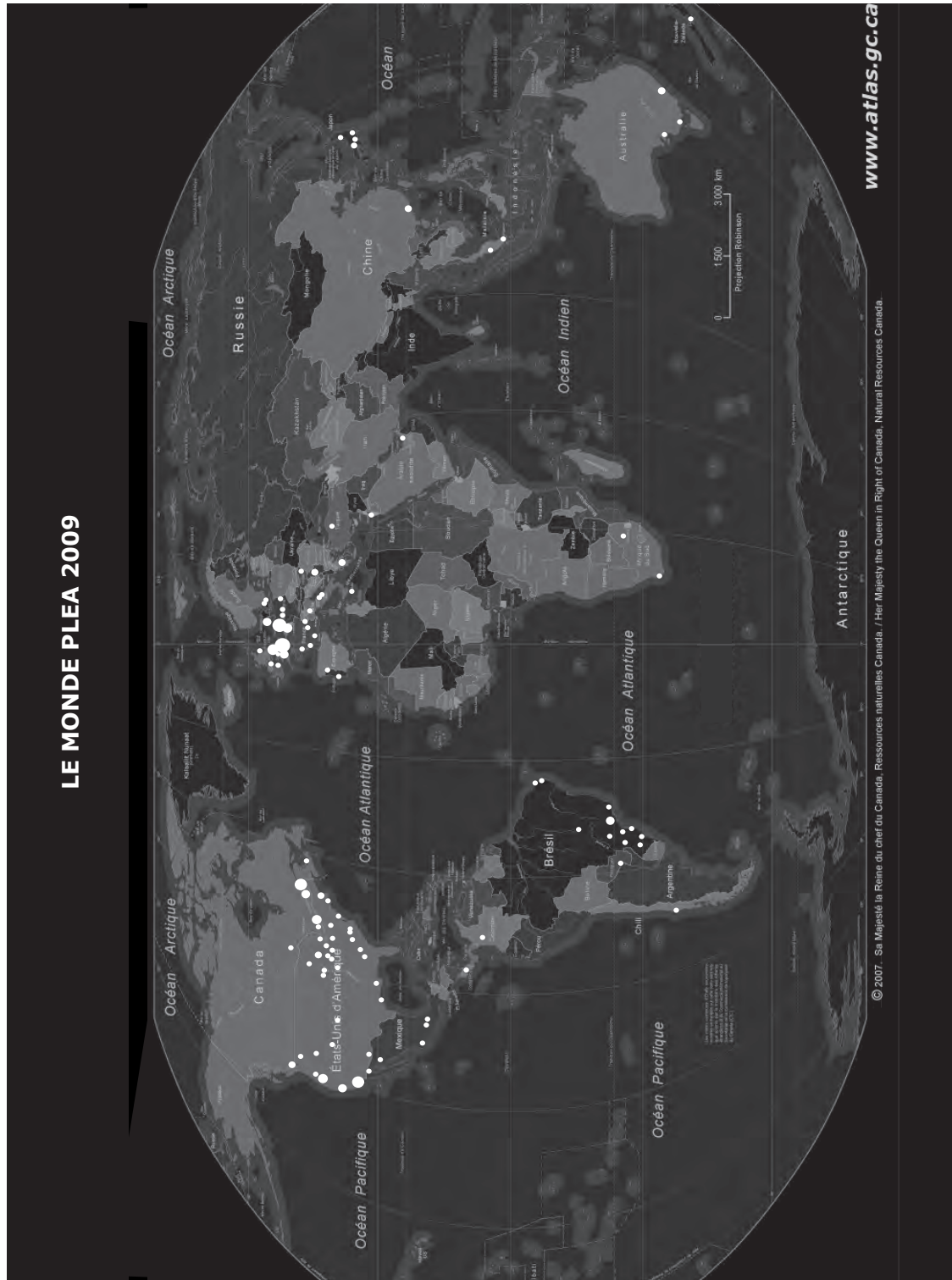
la Maison du 21^e siècle
LE MAGAZINE DE LA MAISON SAINTE



AQME
ASSOCIATION QUÉBÉCOISE
POUR LA MAÎTRISE DE L'ÉNERGIE

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A WORD FROM THE DEAN Laval University, School of Architecture

The reduction of energy consumption acknowledging the inhabitants' needs is one of the most challenging issues facing today's architects, engineers, urban planners, and builders. Laval University is honored and proud to host the 2009 PLEA Conference that gathers 250 delegates from 40 countries to address this issue. Together, the delegates will share their knowledge, present the results of recent research works, and propose new strategies and innovative solutions integrating the 'active' occupants' behavior into genuine 'passive' low energy architecture and urban development.



The Conference will be held at the School of Architecture of Laval University, which is located in the Vieux Séminaire de Québec, one of the oldest buildings in North America. I hope that the delegates will appreciate the charm of the Old Historic City, its distinctive architecture combining French and English heritage, its fine cuisine, and its rich cultural activities.

This Conference could not be held without the contribution of many people in three different committees (Local organizing Committee, International Advisory Committee, and Technical Committee) and the support of many partners and sponsors. I want to acknowledge all those people and organizations for having believed in the success of the Conference, and for their yearlong hard work.

I wish all delegates a lot of inspiring discussions and a very pleasant stay in Québec City. I hope that your stay will be profitable and contribute to your academic and professional development.

Richard Pleau

Doyen - Dean

Faculté d'aménagement, d'architecture et des arts visuels
Université Laval

WELCOME

The Groupe de recherche en ambiances physiques (GRAP) at Laval University School of Architecture celebrates this year its 10th anniversary of research, teaching and development in the field of environmental architecture and urban design. We are particularly pleased to welcome back the International PLEA Community to North-America after an absence of more than 19 years.

The theme of this 26th international conference on Passive and Low Energy Architecture addresses our quest for passive and low energy architecture through the occupant’s perspective. In the current context of important technological developments in the fields of alternative materials and energy, the aim of the conference is to position users’ behavior as a key ‘active’ determinant of energy performance in ‘passive’ design through adaptive opportunities. Building under extreme climates represents a particular challenge for designers and users since the underlying paradigm of energy conservation and exclusive operation mode dramatically reduces the extent of selective strategies otherwise available under more temperate climes. The conference particularly seeks to identify passive design strategies in extreme climates improving occupants’ comfort and productivity whilst encouraging environmental diversity and minimizing our ecological footprint.

This conference presents the most recent thoughts and researches in the rapidly evolving world of low energy architecture and occupants behavior through 171 scientific papers selected by our International Technical Committee amongst more than 500 extended abstract submissions. The range and breath of the final paper submissions allowed us to organize the conference and the accompanying proceedings into three main chapters closely adhering to the conference theme:

Challenges

Doctor Raymond Cole and Zosia Brown launch the debate with a provocative presentation on the Human and Automated Intelligence in Comfort Provisioning. This keynote demonstrates that an important shift is required from conceptualizing the occupant as a passive recipient of a set of indoor conditions, to the inhabitant who may play a more active role in the maintenance and performance of their building. Three specialized oral and poster sessions on the Occupants, Communities and Education further explore our most serious challenges.

Strategies

Professor G.Z. Brown emphasizes the importance of the passive building/active occupant duo in Pleasure and Performance. This keynote suggests that the integration of passive bioclimatic strategies can provide intense sensory and mental pleasure while optimizing both the building’s

and the occupants’ performances. Architect Peter Busby also challenges professionals to Move from Buildings to Communities for the Future of Sustainable Design. Three specialized oral and poster sessions present Daylighting, Passive Heating/Cooling and Post-Occupation Evaluation strategies as cornerstones of genuine low energy architecture.

Integration

Architect Bruce Kuwabara, engineers Thomas Auer and Glen Klym and project manager Tom Gouldsborough share their professional experience leading to the newly built Manitoba Hydro Place where IDP was integral to balancing energy performance goals against objectives of signature architecture, urban revitalization, and supportive workplace. Finally, three specialized oral and poster sessions present recent developments in the IDP process, Certification Tools and Innovative Materials and Systems.

Each theme follows a general structure from the more fundamental to the more applied topics. Tools and case studies closing papers should therefore help demonstrate more theoretical concepts. We hope that you will appreciate this structure of the conference also adopted for a more fluid and organized reading in the Book of Proceedings.

Editors
Claude MH Demers, André Potvin



COMMITTEES

Local Organising Committee

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Azimuts	Event Management

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Donald Watson	Architect, Professor, FAIA, USA

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J Owen Lewis	University College Dublin, Dublin, Ireland, UK
Edward NG	Chinese University of Hong Kong, China
Miguel Aloysio Sattler	Federal University of Rio Grande do Sul, Brazil
Donald Watson	Architect, Professor, FAIA, USA
Claude Demers	Université Laval, Canada
André Potvin	Université Laval, Canada

ACKNOWLEDGEMENTS

Hosting a scientific event such as PLEA2009 demands considerable effort and dedication from a wide range of people. We would particularly wish to thank the following:

- The PLEA Board of Directors, in particular Koen Steemers and Simos Yannas, for inviting GRAP to host this 26th PLEA conference in North-America;
- The Dean of the Faculté d’aménagement, d’architecture, et des arts visuels de l’Université Laval, Richard Pleau, for supporting the event event from the onset and providing the conference venue, the assistance of a great programming analyst Francis Brochu, and an essential sponsorship agent Claude Belzile;

ACKNOWLEDGEMENTS

- The PLEA2009 International Technical Committee for thoroughly revising all submissions ensuring that research standards were carefully observed. We wish to acknowledge their exceptional contribution, considering this year’s limited members of the Committee, in providing essential inputs to authors;
- The Keynote Speakers, Raymond Cole, G.Z. Brown, Peter Busby, Bruce Kuwabara, Thomas Auer, Tom Gouldsborough, and Glen Klym, for immediately accepting our invitation with great enthusiasm and interest;
- The Authors of papers, both submitted and accepted, for their great enthusiasm, patience, insights and essential contribution in the success of PLE2009;
- The PLEA2009 main partners, Lemay & Associates Architects, the Agence de l’efficacité énergétique, the Société immobilière du Québec and the Ville de Québec, for their generous support;
- The PLEA2009 numerous sponsors and supporters for their essential contributions despite the difficult economic context;
- The PLEA2009 Voluntary Grads and Undergrads for patiently guiding the delegates through the numerous hidden corners of our conference venue;
- And lastly but by no means least, The Local Organizing Committee for spending countless hours resolving all the important details leading to a successful event, in particular the ‘face behind plea2009@arc.ulaval.ca’ Mathieu Coulombe, Webmestre Victor Rodrigue, Proceedings Edition Reviewers Marie-Pierre Paré, Pierre Lépine, Ilana Pichon, and finally Event Managers Catherine Beaudet and Monick Debroux from Azimuts.

KEYNOTE SPEAKERS

Ray Cole

Ray Cole is Professor and Director of the School of Architecture and Landscape Architecture at the University of British Columbia. He has been teaching environmental issues in building design in the Architecture program for the past thirty years. Dr Cole is the Academic Director of the Design Centre for Sustainability - the focus of sustainability related research within the School. He was co-founder of the Green Building Challenge - an international collaborative effort to benchmark progress in green building performance and environmental assessment - and has served on build numerous national and international committees related to buildings and the environment. Dr Cole was selected as a North American Association of Collegiate Schools of Architecture Distinguished Professor for “sustained commitment to building environmental research and teaching” in 2001. In 2003 he received the Architectural Institute of British Columbia Barbara Dalrymple Memorial Award for Community Service and the US Green Building Council’s Green Public Service Leadership Award. He is currently a Director member of the Canada Solar Buildings Research Network, a past Director member of the Canadian Green Building Council, and holds the UBC designation of Distinguished University Scholar.



Peter Busby

As Managing Director of Busby Perkins+Will, Peter oversees over 100 employees working on projects across North America and around the globe. A founding member and current Chair of the Canada Green Building Council, Peter is recognized internationally as a leader in green building design and leads what is considered one of North America’s leading green design practices with the largest portfolio of built green projects in Canada. In recognition of his professional and community contributions, Peter was invested as a member of the Governor General’s Order of Canada in 2005. In 2008 Peter was conferred an Honorary Doctorate in Science by Ryerson University.



KEYNOTE SPEAKERS

G.Z. Brown

G.Z. “Charlie” Brown is the founding director of the Energy Studies in Buildings Laboratory at the University of Oregon and a nationally recognized educator, author, and researcher on daylighting and energy use in buildings. Brown has authored or coauthored books, software applications, and more than 100 papers and reports including “Sun, Wind & Light” which has been translated into Mandarin, Chinese, Spanish and Portuguese. He has been a Fulbright scholar in Norway and in Nigeria. Brown received the Cascadia Fellows Lifetime Achievement Award in 2008 and the U.S. Green Buildings Council 2005 Leadership Award in research for his work on sustainable building practices. He was elected into the College of Fellows of The American Institute of Architects in 2006, and selected as a Fellow by the American Solar Energy Society in 2005. Brown has been honored Society of Building Science Educators, now with more than 250 members in countries around the world. The Energy Studies in Buildings Laboratory has performed more than \$16 million in externally funded research since 1977 when Brown joined the faculty. The lab has supported more than 200 graduate research assistants and provided design assistance in energy conscious design on over 17 million square feet in the U.S. and abroad.



Bruce Kuwabara

Bruce Kuwabara is a founding partner of the Toronto-based firm of Kuwabara Payne McKenna Blumberg Architects and the 2006 RAIC Gold Medalist. His projects have been recognized in Canada with eight Governor General's Awards for Architecture, and internationally by the American Institute of Architects, the Chicago Athenaeum, and the Royal Institute of British Architects. He chairs the design review panel for Waterfront Toronto, and sits on the board of the Canadian Centre for Architecture (CCA).



KEYNOTE SPEAKERS

Thomas Auer

Trained as a Process Engineer at the Technical University in Stuttgart, Thomas Auer is a partner and managing director of Transsolar GmbH, a German building energy design consultancy. Thomas is a specialist in integrated building systems and energy efficiency in buildings. Projects include the naturally-ventilated Hochtief Prisma in Frankfurt, Bad Aibling, and the Federal Foreign Office in Berlin. Thomas teaches at the Yale University School of Architecture and speaks frequently at conferences and symposia.



Tom Gouldsborough

Tom Gouldsborough, Division Manager of Corporate Planning & Business Development for Manitoba Hydro, has acted as Project Manager for Manitoba Hydro Place since 2002. He played an integral role establishing design parameters and the project charter, and ensuring the vision and objectives were realized in built form. Tom is also responsible for Corporate Strategic Planning, Performance Measurement and business development, including mergers and acquisitions. Tom has an engineering background in Electrical Utility Design, Construction and Commissioning and a Bachelor of Science in Electrical Engineering from the University of Manitoba.



Glen Klym

Glen Klym is a LEED Accredited Architect with Smith Carter Architects and Engineers. He was the Project Manager and Architectural team LEED coordinator for Manitoba Hydro Place. With a diverse background in architecture and construction and a passion for sustainable design, Glen fosters enthusiasm for the setting of realistic goals early in a project. A strong proponent of the IDP process, Glen is a trained LEED Charette Facilitator and most recently was responsible for managing development of the LEED certification package for Smith Carter’s corporate headquarters.



GENERAL INFORMATION

Québec City

Quebec City is the only walled city North of Mexico. The city is intimate and romantic, home to gracious architecture, proud French-Canadian culture and international cuisine. The city's historic district is well preserved, recognized by UNESCO as a World Heritage Site, one of only two such designations in North America. Capital of Nouvelle-France and later of the English colony, Quebec City became the capital of the Province of Quebec in 1867. Today, there are about 600,000 people living in the greater Quebec City area.

Conference Venue

PLEA 2009 will be held at Laval University School of Architecture, a 350 year old building in the heart of historic Quebec City and founding site of Laval University by the Séminaire de Québec. The extensive courtyard structure is surrounded by narrow streets framing views to the old Laurentian Mountains, the Orléans Island and the majestic St-Laurence River. Delegates will find banking, shopping, restaurants, bars, post-office and convenient bus stops nearby. Two maps at the end of this program will help delegates find their way in and around the conference venue.

Chapiteau

The Chapiteau, erected in the central courtyard of the Vieux-Séminaire, is the general gathering area of the conference. Lunch and Tea/Coffee breaks will be served here from Monday 22nd to Wednesday 24th June. Make sure you wear your badge at all times since the central courtyard will remain open to the public during the conference.

Registration Desk

Enquiries regarding the following should be made at the registration desk located under the Chapiteau:

- Registration to the conference and collection of your delegate pack and badge
- Handling of your presentation on CD and preview with a PLEA staff member
- Payment queries relating to your registration
- Certificate of attendance for OAQ OAA continuing education program
- PLEAjunior registration
- Booking of tours
- Booking a taxi
- Urgent messages to be posted on the message board
- Lost and found articles

The registration will begin on Sunday 21st June from 13:30 to 18:00 and will continue throughout the conference at the following times:

Monday 22nd June	7:00 to 18:00
Tuesday 23rd June	7:00 to 18:00
Wednesday 24th June	7:00 to 16:00

Badges

Your badge must be worn at all times as it is your passport to all gathering events such as Vin d’honneur, lunch, tea/coffee breaks, réception d’ouverture and conference sessions. A replacement charge of 20\$CAD is applicable for a lost badge. We also provided in your delegate pack a complimentary Laval University ecocup for use at all breaks and lunches. Please bring it at all times in order to limit waste or useless recycling.

Web Desk

Due to the massive gravity wall of the building and the scattered nature of the venue, we could not guaranty the quality of wireless internet and therefore encourage you to use our Web Desk in the School of Architecture, Room 1119, from 9:00 to 17:00.

PLEAjunior

Passive and low energy activities are planned on Monday afternoon 22nd June and Tuesday morning 23rd June for accompanying children aged 5-8 and 9-13 under the Chapiteau. This activity is free of charge but parents should make sure they have registered their children prior to the activity. Children lunch tickets can be purchased at the registration desk at low cost.

Parking

Due to its historic dense fabric, parking in the city centre can be difficult. 15 free parking stalls will be available for the delegates on the basis of the first comers. Additional spaces are available at a daily rate of 14\$CAD.

Accommodations

Student's Residence : 418 656-5632	(See Map H1)
Hôtel Clarendon : 418 692-2480	(See Map H2)
Hôtel Château-Bellevue : 418 692-2573	(See Map H3)
Fairmont Le Château Frontenac : 418 692-3861	(See Map H4)

GENERAL INFORMATION (Cont.)

Transport

All conference events and accommodations, apart from the Students Residences on Laval University main campus, are located within easy walking distance. The Quebec City public transit system (RTC) buses are available from the venue to almost everywhere in the city. The main bus station is located in Carré d'Youville (*see map T1b*). The two main lines going from the campus to the venue are the 800 and 801 (see map to locate bus stop). Exact money is necessary to take the bus. Tickets are also available at the Couche Tard (*see map T2b*). Fares : One-way with exact money : 2,60\$. One-way with ticket : 2,45\$. One-day ticket : 6,45\$. An RTC leaflet is available in your delegate pack. For more demanding upward-downward strolls, the delegates may want to hop on and off our new free to ride Ecolobus linking all major city centre attractions. Taxis queues are available at the main bus station in Carré d'Youville and in front of the City Hall located at Place de l'Hôtel de Ville, directly outside the conference venue main entrance.

Eating Out

Québec City is well known for its fine table. A complete restaurant guide has been placed in your delegate pack. Some of our Faculty/Students favorites' are pointed out on the Old Town Map at the end of this program. In Canada, **gratuities** are not included in restaurant bills, but are left to the discretion of the customer. It is usual to leave a gratuity of 15% of the total cost before taxes added to the bill. This same policy applies to taxi fares. Porters expect \$ 1 CAD per suitcase.

Health and Personal Insurance

Access to Canada's health care services is very costly for non-residents; therefore, it is recommended that participants arrange health and accident insurance prior to travelling to the Conference. It is also recommended that insurance against possible loss of luggage or travel disruption be retained.

Currency Exchange

Canadian and American dollars are not at par. American currency is accepted in most establishments at a variable exchange rate. Legal tender is the Canadian dollar which divides into 100 cents. The coin in use are of the following denominations: 1, 5, 10 and 25 cents, as well as one and two dollars. Bills come in the following denominations: 5, 10, 20, 50 and 100 dollars. Currency foreign exchange offices are open 7 days a week in Old Québec during the high season.

PLEA JUNIOR

PLEA 2009 local organizers love kids. Aren't they the occupants of our low carbon society of tomorrow? Accompanying children and possibly teenagers will be invited to engage in intellectual as well as hands-on low-tech 'scientific' activities supervised by GRAP grads. Results of these sessions will be presented during the Gala Dinner.

These activities are scheduled on Monday afternoon, June 22nd (13:30-17:00) and Tuesday morning, June 23rd (8:30-12:00) and might need to be adapted or modified, as we essentially rely on exterior conditions for some activities. Older children are welcome to bring their own cameras to record these live experiments!

A house for Helios and Skotos

Two consecutive PLEAjunior periods to design and test scale models.

In architecture, the sun provides LIGHT and HEAT, two forms of energy that are essential for the occupants. The sun rhythms our lives according to its seasonal and daily cycles. These cycles are determined by the complex geometry of sun patterns. This activity proposes an introduction to the use of a heliodon, a simple design tool to predict the position of the sun for your latitude.

Helios and Skotos are building a house and its outdoor extensions for their family and friends. Imagine their daily activities at different periods of the year... What do they like to do inside in summer? in winter? Try to provide a variety of spaces that offer exposure to the sun in winter to keep people warm, and shadow protection for hot summer days. For this activity, you can bring your favorite Playmobil or Lego characters if you want.

HEAT: A solar oven for Helios' outdoor picnics

The sun can provide enough heat to keep us warm, but also to cook meals. Helios is organizing a party, and to save energy, his friends decided to build a solar oven with readily available materials. They will test the oven with a thermometer and see if they can cook something simple and edible... Infrared camera will also record the performance of this zero-carbon appliance.

LIGHT: A skylight for Skotos' workshop

Inspired by Helios's friends and their unplugged oven, Skotos decided to save even more energy by taking advantage of daylighting. His workshop is too dark and gloomy with its single tiny window. With a few changes, he might just get the light he needs to be more happy and even enjoy an occasional view to look at the sky to inspire him. Video camera will record Skotos daily and seasonal workshop changing atmosphere.

CMHC WORKSHOP Wednesday, June 23

Topics: *Energy*
 Equilibrium Housing

Presenters: *Wendy Pollard, Senior Research and Information Transfer Advisor*
 Douglas B. Pollard, Senior Researcher in Sustainable Community Planning

Timeframe: *3 hours*

Energy supply and demand are issues that must be addressed in order to achieve sustainability both at the community level and the level of the individual household. This presentation will approach this topic from both perspectives – Community Energy Solutions and Equilibrium homes.

Community Energy Solutions

The reasons for the growing importance of energy supply and demand include energy security; vulnerability to price shocks; the need for growth of local economies; as well as environmental concerns. What are energy needs now and the projected needs for the future? What education approaches can and should be used to encourage industry and the public to save energy? What are the opportunities for future energy supply? How can monitoring of consumption and measurement of energy usage help long term energy planning? What viable alternative energy approaches are available in the marketplace that makes sense for a particular community? These are the issues facing communities around the globe, and these are the topics that are addressed in this session.

Equilibrium Housing

Equilibrium is a national housing initiative led by Canada Mortgage and Housing Corporation (CMHC), that brings the private and public sectors together to develop homes, and eventually communities that address occupant health and comfort, energy efficiency, renewable energy production, resource conservation, reduces environmental impact and affordability. Equilibrium housing integrates a wide range of technologies, strategies, products and techniques to reduce a home’s environmental impact to an absolute minimum. At the same time, Equilibrium housing also features commercially available, on-site renewable energy systems to provide clean energy to help reduce annual consumption and costs. The ultimate goal is a highly energy-efficient low environmental impact house that provides healthy indoor living for its occupants, and produces as much energy as it consumes on a yearly basis.

WORKSHOP SCHL Mercredi, 23 Juin

Sujets : *Énergie*
 Maison EquilibriumMC

Animateurs : *Wendy Pollard, Chercheure Senior*
 Douglas B. Pollard, Chercheur Senior

Durée : *3 heures*

Nous devons résoudre les problèmes concernant l’offre et la demande d’énergie afin de produire des collectivités et des logements durables. La présentation abordera ce sujet sous ces deux angles: les solutions éconergétiques à l’échelle des collectivités et les maisons EquilibriumMC.

Solutions éconergétiques à l’échelle des collectivités

Plusieurs facteurs sont responsables de l’importance croissante de l’offre et la demande d’énergie, notamment la sécurité énergétique, la vulnérabilité aux chocs de prix, le besoin de croissance des économies locales, ainsi que les préoccupations environnementales. Quels sont les besoins énergétiques actuels et quelles sont les prévisions futures à cet égard? Quelles démarches éducatives peuvent et doivent être utilisées pour inciter les entreprises et les particuliers à économiser de l’énergie? Quelles sont les possibilités futures d’approvisionnement en énergie? Comment la surveillance de la consommation et la mesure de l’utilisation de l’énergie peuvent-elles aider à la planification à long terme des ressources énergétiques? Quelles solutions de rechange viables en matière d’énergie offertes sur le marché peuvent convenir à une collectivité en particulier? Voilà les enjeux auxquels sont confrontées les collectivités partout dans le monde et les sujets qu’abordera la présentation.

Maison EquilibriumMC

EquilibriumMC est une initiative nationale de logement, dirigée par la Société canadienne d’hypothèques et de logement (SCHL), qui réunit les secteurs public et privé dans le but de mettre au point des maisons et ultérieurement des collectivités axées sur la santé et le confort des occupants, l’efficacité énergétique, la production d’énergie renouvelable, la conservation des ressources, la réduction des impacts sur l’environnement et l’accessibilité financière. La maison EquilibriumMC intègre un large éventail de technologies, de stratégies, de produits et de techniques conçus pour réduire à un minimum absolu l’incidence d’une habitation sur l’environnement. En outre, ces maisons se caractérisent par leurs systèmes de production d’énergie renouvelable sur place, offerts sur le marché, qui les approvisionnent en énergie propre et contribuent à réduire les coûts et la consommation annuels.

SOCIAL PROGRAM

Vin d'honneur

Date: Sunday, June 21st

Time: 17:00 – 18:00

Venue: Chapiteau (Vieux-Séminaire Courtyard)

Cost: Included in the registration fee

Dress: Casual

Delegates arriving on Sunday are welcomed to join us in the 17th Century central courtyard of the Vieux-Séminaire for a Vin d'honneur. Since 1988, The School of Architecture has returned to this original site of Laval University founded in 1852.



Cocktail de bienvenue

Date: Monday, June 22nd

Time: 19:00 – 20:30

Venue: Chapelle de l'Amérique française

Cost: Included in the registration fee

Dress: Smart Casual

This welcome reception will be held in the Baroque atmosphere of the Chapelle de l'Amérique française which is part of an extensive museum complex dedicated to the research and diffusion of the French culture in the Americas.



Gala Dinner

Date: Tuesday, June 23rd

Time: 19:00 – 22:00

Venue: Château Frontenac

Cost: 125\$CAN

Dress: Smart Casual

The Gala Dinner will be held at the iconic Neo-Victorian Château Frontenac. World-known Chef Jean-Soulard has created a menu combining traditional and more contemporary terroir cuisine for your enjoyment. Annual PLEA Awards and parallel PLEAjunior activities outcome will be presented to the delegates.



Saint-Jean-Baptiste Day

Date: Tuesday, June 23rd, 8:00 PM. *Outdoor and free.*

Location: Parc des Champs-De-Bataille

Québec's national holiday. Festivities held on June 23rd featuring a show, bonfire and a fireworks display all beginning at 8 p.m. at Battlefields Park. The feast day of *Saint-Jean- Baptiste* was a very popular event in the *Ancien régime of France*. The tradition landed in Canada with the first French colonists. According to the *Jesuit Relations*, the first celebrations occurred on the evening of June 23, 1636 with a bonfire and five cannon shots.

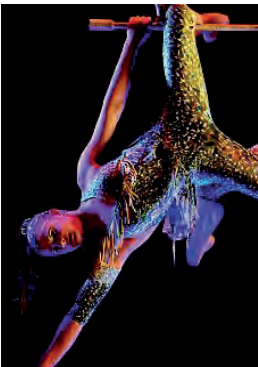


Open Air Circus by Le Cirque du Soleil

Date: Starting June 24, and every night since then. *Outdoor and free.*

Location: Downtown Québec City

From a group of 20 street performers at its beginnings in 1984, *Cirque du Soleil* is now a major Quebec-based organization providing high-quality artistic entertainment. With now more than 4,000 employees from over 40 different countries, including 1,000 artists, the world famous *Cirque du Soleil* has brought wonder and delight to almost 90 million spectators. In addition to all their shows around the globe, *Cirque du Soleil* is presenting an exclusive open air show in the streets of downtown Québec city during the summer.



The Image Mill

Date: Starting 3rd of July, Every night, 22:00 to 23:00, *Outdoor and free.*

Location: Downtown Québec City

For those who are planning to spend more days in Québec City, be sure not to miss the worlds' widest projection (0,6 km) against the 81 grain silos boarding the *Bassin Louise*. The *Image Mill* is a sort of animated mosaic that, moving from engravings to paintings and from photos to videos, creates an impressionistic portrait of the city over time. The huge concrete structure becomes a narrator that tells the tale of Québec City's 400 years of history.



ARCHITECTURAL TOUR

Wednesday, June 24th, 3:30 - 5:30

Espace 400e (1)

Architects : Consortium of Dan Hanganu, architects and Côté Leahy Cardas, architects

This festive building, located on the edge of the Bassin Louise, was created for the 400th anniversary of Quebec City in and around the existing structure of an early 20th century cement factory. This twice-recycled structure integrates several sustainable features including a double-skin envelope, geothermal energy, and daylighting. Conferences, exhibitions as well as concerts are now taking places in this new coveted public amenity.

Gene H. Kruger Pavillon (2)

Architects : Gauthier, Galienne, Moisan + GRAP

The Gene H. Kruger, a recent addition on the Laval University main campus, is home to the Wood Engineering Research Center. The IDP team created a highly stimulating environment for the users while limiting its environmental footprint. Ecosensible strategies such as integral wooden structure and envelope, extensive daylighting, hybrid ventilation, and passive solar air preheating combined to create a new sustainable standard for the future of the Laval campus.

Promenade Samuel de Champlain (3)

Architects : Consortium Daoust Lestage, Williams Asselin Ackaoui, Option Aménagement

Following decades of industrial presence along the St-Lawrence River, the Commission de la Capitale nationale du Québec initiated this extensive eco landscaping project to give back the river to its inhabitants. With its incredible views, the 2.5 km trail has quickly become one of the most attractive site for walking and cycling. The design and development of this esplanade won numerous prizes as well as being selected amongst the 224 projects unveiled by the jury of the World Architecture Festival that was held in Barcelona in 2008.

ARCHITECTURAL TOUR*, Wednesday June 24th, 3:30 pm to 5:30 pm.

Please meet at the conference registration desk at 3:15.

* Online Registration at <http://www.plea2009.arc.ulaval.ca/> before June 14th.



HISTORIC TOUR, CITY CENTER

Wednesday, June 24th, 3:30 - 5:30

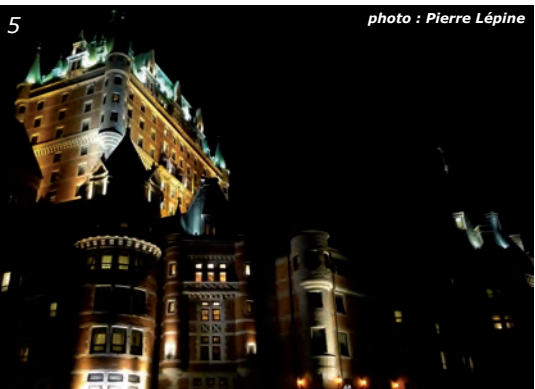
With its fortification walls, narrow winding streets and historic buildings (1), Quebec is renowned for its beauty and history. In 1985, Quebec became the first city on the continent to be placed on the World Heritage List of UNESCO. Besieged six times in its history, Quebec was finally conquered by the British General Wolfe in the Bataille des Plaines d'Abraham in 1759. Capital of New France, then capital of British North America, Quebec is today the heart of the French culture in North America.

The walking tour begins at the **Séminaire de Quebec** (2), founded in 1663 by Monseigneur François de Montmorency-Laval. This institution sets in a remarkable collection of buildings which include the parlor, the Petit Séminaire de Québec, the Grand Séminaire de Quebec, the priests' residence, the Musée de l'Amérique française and the Chapelle de la Congrégation erected around an enclosed courtyard. Next to the Séminaire is the magnificent **Notre-Dame de Québec Basilica** (3). Built in 1647, it is the oldest basilica in North America. Features such as the windows, retable and lamps of the sanctuary were actually offered by Louis XIV.

Next stop is the **Terrace Dufferin** (4), a magnificent boardwalk overlooking the St. Lawrence River. This structure was created in 1879 by the Governor General of Canada, Lord Dufferin. The terrace, which gives the city an air of seaside resort, is 671 meters long and is one of the main attraction of Quebec City. Boarding the terrace is the **Château Frontenac** (5) which opened its doors for the first time in 1893. Constructed in the style of the Châteaux de la Loire in France, the dramatic silhouette of the Château Frontenac rapidly became a symbol for the city and for the entire country. It is said that Le Château Frontenac is the most photographed hotel in the world. Finally, located in Québec City's lower town, **Place Royale and the Notre-Dame de la Victoire Church** (6) constitute the last features of the tour. The square and its surrounding area were meticulously re-built in the 70s in order suggest the atmosphere of the 18th century town at the end of the French Regime.

HISTORIC TOUR, CITY CENTER*, Wednesday June 24th, 3:30 pm to 6:00 pm. Fee : CAD\$30
Tour includes : Professionnal historian guide. Taxes non-included.
Please meet at the conference registration desk at 3:15.

* Online Registration at <http://www.plea2009.arc.ulaval.ca/> before June 14th.



NOTES

PLEA 2009
SCIENTIFIC PROGRAM



Architecture Energy and the Occupant's Perspective

PLEA 2009

Québec, Canada



	Sunday 21 June	Monday 22 June CHALLENGES				Tuesday 23 June STRATEGIES				Wednesday 24 June INTEGRATION			
07:45	Chapiteau	Chapiteau	Promotion	Amphithéâtre	Réfectoire	Chapiteau	Promotion	Amphithéâtre	Réfectoire	Chapiteau	Promotion	Amphithéâtre	Réfectoire
08:30		Registration	Session Chairs + Keynotes petit-déjeuners (1204)			Registration	Session Chairs + Keynotes petit-déjeuners (1204)			Registration	Session Chairs + Keynotes petit-déjeuners (1204)		
09:30			Opening Addresses and Announcements Dean, PLEA, GRAP, AEE Keynote Presentation Dr Ray Cole, CIRS-UBC			PLEAjunior	Keynote Presentations G.Z. Brown ESBL-UO Peter Busby, Busby Perkins+Will architect				Keynote Presentation B. Kuwabara, T. Auer, T. Gouldsborough G. Klym -Manitoba Hydro Consortium		
09:45			AEE				Lemay			Tea/Coffee	Posters		
10:10		Tea/Coffee	Posters			Tea/Coffee	Posters				IDP	Certification	Materials
			Communities Chair: Goehring, A.	Occupants Chair: Velikov, K.	Education Chair: Guzowski, M.	PLEAjunior	Daylighting Chair: Schiller, M.	Heating/Cooling Chair: Tablada, A.	POE Chair: Janda, K.B.		Chair: Brunsgaard, C.	Chair: Rivera, A.	Chair: Utzinger, M.
12:00	Registration begins	Lunch				Lunch				Lunch			
13:00			GLCRM CCNQ				STGM SCHL				CIMA+ SSQ Immobilier		
14:30		PLEAjunior	Communities Chair: Roggema, R.	Occupants Chair: Joubert, C.G.	Education Chair: Wasley, J.		Daylighting Chair: Altomonte, S.	Heating/Cooling Chair: Janson, U.	POE Chair: Straka, V. SCHL Workshop		Closing PLEAnary Session Chair: Dubois, M-C. Best Oral/Poster Awards Closing Address		
14:50		Tea/Coffee	Posters			Tea/Coffee	Posters				SCHL		
		PLEAjunior	Communities Chair: Sémidor, C.	POE Chair: Elzeyadi, I.	Heating/Cooling Chair: Sandifer, S.A.		Daylighting Chair: Theodorson, J.	Heating/Cooling Chair: LaRoche, P.	POE Chair: Anderson, R.V. SCHL Workshop	PLEA Board of Directors Annual Meeting	Architectural Tour* (Kruger, Espace 400e, Quai des Cageux Promenade Samuel de Champlain) Historic Tour*		
16:20	Vin d'honneur	Tea/Coffee	Posters			Tea/Coffee	Posters						
16:40	Hudon+Julien ABCP		IRAC				CBDC						
17:40		PLEAnary Session Chair: Potvin, A.				PLEAnary Session Chair: Demers, C.M.H							
19:00		Cocktail d'ouverture Chapelle de l'Amérique française				Gala Dinner* Château Frontenac PLEA2009 Award							

Parallel Activity
Oral Presentation, Keynote or PLEAnary

Poster Presentation
Communal Activity
* Activity non-included in Registration Fee



Promotion	Amphithéâtre	Réfectoire
07:45	Registration @ Chapiteau and Session Chairs + Keynotes petit-déjeuners @ 1204	
08:30	Opening Address and Announcements @ Promotion Dean, PLEA, GRAP, AEE	
09:45	Keynote Presentation Dr. RAYMOND J. COLE & ZOSIA BROWN , CIRS, University of British Columbia Human and Automated Intelligence in Comfort Provisioning	
10:10	<i>Tea/Coffee, and OCCUPANTS Posters @ Chapiteau</i> 1.1.12 The Architect's Convictions & the Client's Perspectives: A Case Study on Non-Technical Barriers. <i>Luiz Paulo Coelho de Almerida Reis, Aloisio Leoni Schmid</i> 1.1.14 Comfort Delivery on Demand: An Adaptive Approach to Comfort Systems in Dwellings. <i>Noortje Alders, Stanley Kurvers, Hans Cauberg</i> 1.1.15 The Impact of Occupants' Behavior on Electric Light Usage: A Case Study of Three Milwaukee, Wisconsin Nature Centers. <i>Leyla Sanati, D. Michael Utzinger</i> 1.1.16 Thermal performance and the Inhabitants' Response: The Case of the Palapa in Colima, Mexico. <i>Adolfo Gomez-Amador, Armando Alcantara, Alicia Delgado</i> 1.1.17 Retrofit of Bungalow Houses in Quebec to Improve Energy Efficiency and Thermal Comfort. <i>Jean-Philippe Saucier, Marie-Claude Dubois</i> 1.1.18 The Effect of Technological User Control Systems on Occupants of Sustainable Energy Homes The BASF House, Nottingham, UK. <i>N. Hormazabal, M. Gillott, G. Guzman, G. Revell</i> 1.1.19 Control System for Energy Reduction in Vacant Environments. <i>Filbert Musau</i>	
12:00	LUNCH @ Chapiteau	
13:00	ORAL PRESENTATION	

COMMUNITIES	OCCUPANTS	EDUCATION
<i>Chair : A. Goehring</i> 1.2.1 Quadruple the Potential: Scaling the Energy Supply. <i>R.Roggema, L.Middleton, A.V.D. Dobbelsteen</i> 1.2.2 Productive Urbanisms: From Runways to Greenways. <i>Mason White, Lola Shieppard</i> 1.2.3 The Nature People Spectrum: Linking Experiences with Settings and Activities. <i>Sue Donaldson</i> 1.2.4 Morphometric Integrators of a Sustainable City. <i>Luc Adolphe</i> 1.2.5 Proposal of Indicators Dedicated to the Analysis of Contribution of Urban Projects to Urban Heat Island. <i>K.Athamena, M.Musy, J.Bouyer</i> 1.2.6 Causes of Urban Heat Island in Singapore: An Investigation Using Computational Fluid Dynamics. <i>Rajagopalan Priyadarsini, Wong Nyuk Hien</i>	<i>Chair : K. Velikov</i> 1.1.3 Retrofitting Homes for Better Energy Performance: The Occupant's Perspective. <i>Paula San Payo Cadima</i> 1.1.1 Buildings Don't Use Energy : People Do. <i>K.B.Janda</i> 1.1.2 New Expectations in Delivering Sustainable Building : From Occupant to Inhabitant. <i>Z.Brown, R.J. Cole, M.O'Shea, J.Robinson</i> 1.1.4 "Passive" Building Design and Active Inhabitants: The Potential of Frugal Hedonism? <i>Deborah White</i> 1.1.5 Low Energy Architecture / Low Energy Living : Strategies for Passive Design at the Urban and Building Scales. <i>Lisa D. Iulo</i> 1.1.6 Optimising Life Cycle Energy Performance of Housing: The Value of Occupancy Control. <i>Pabxi Hernandez, Paul Kenny</i>	<i>Chair : M. Guzowski</i> 1.3.1 Crystallized Pedagogy: Architecture as a Medium for Sustainability Education. <i>Erik Bonnett, Victor W. Olgyay</i> 1.3.2 Teaching Sustainable Strategies in Architecture: Learning from the Global Perspective. <i>Jörg Rügemer</i> 1.3.3 Transparencies: Reflections on the Evolution: Recurrences and Alternatives under an Environmental Perspective. <i>Silvia Morel Correa</i> 1.3.4 The Society of Building Science Educators' Carbon Neutral Design Project: The CND Building Case Study Protocols. <i>James H. Wasley, Michael Utzinger</i> 1.3.5 Carbon Footprinting: A Classroom Exercise. <i>Harvey Bryan, Maria Grimm</i>

COMMUNITIES	OCCUPANTS	EDUCATION
<i>Chair : R. Roggema</i> 1.2.7 Sky View Factor Analysis of Street Canyons and its Implication for Urban Heat Island Intensity: A GIS-based Methodology Applied in Hong Kong. <i>Liang Chen, Edward Ng</i> 1.2.8 Air Ventilation Assessment System for High Density City: an Experience from Hong Kong. <i>Edward Ng</i> 1.2.9 An Outdoor Thermal Comfort Index for the Subtropics. <i>L.M. Monteiro, M.P. Alucci</i> 1.2.10 Microclimatic Performance of Urban Developments: A Simplified Analysis and Representation Technique. <i>A. Potvin, C. Demers, M.-P. Paré</i> 1.2.11 Outdoor Elements Providing Urban Comfort: The Role of Fountains in the Soundscape. <i>Catherine Sémidor, Flora Venot-Gbedji</i> 1.2.12 Green Walls: An Environmental Alternative for the City. <i>Veronica Henriques Ardila, M. C. Giraldo Restrepo, L. F. Echeverri Montoya, O. E. Cano Sepulveda, A. C. Restrepo Acosta</i>	<i>Chair : C.G. Joubert</i> 1.1.7 Passive Low Energy Housing: Paradox of Behaviors. <i>Thomas A. Gentry</i> 1.1.8 A Time Use Survey Derived Integrative Human-Physical Household System Energy Performance Model. <i>Yun-Shang Chiou</i> 1.1.9 Four Years In Four Years Out: Two University Buildings 2000-2008. <i>Jenny Lovell</i> 1.1.10 Energy and Comfort Performance Evaluation after Renovation of an Office Building. <i>Virginie Renzi, Françoise Burgun</i> 1.1.11 North House: Developing Intelligent Building Technology and User Interface in Energy Independent Domestic Environments. <i>Kathy Velikov, Lyn Bartram</i>	<i>Chair : J. Wasley</i> 1.3.6 Integrated Luminous and Thermal Design: A Cold Climate Approach to Zero-Energy Carbon-Neutral Design Education. <i>Mary Guzowski, Loren Abraham</i> 1.3.7 Carbon-Netural McCall: Developing a Zero Energy Campus in McCall, Idaho. <i>Frank Jacobus, Keith Bickford</i> 1.3.8 USA Today: Being and Becoming - Sustainable Architecture in the USA. <i>Ulrike Heine</i> 1.3.9 A Student-Centred POE Approach to Provide Evidence-Based Feedback on the Sustainability Performance of Buildings. <i>Rajat Gupta, Smita Chandiwalla</i> 1.3.10 Designs on the Planet: A Workshop Series on Architectural Education and the Challenges of Climate Change. <i>F.Stevenson, A.Roberts, S.Altomonte</i>

Promotion	Amphithéâtre	Réfectoire
14:30	Tea/Coffee, and COMMUNITIES Posters @ Chapiteau 1.2.18 Outdoor Thermal Comfort in the Hot and Climate: The Effect of Socio-Economic Background and Cultural Differences. <i>Faisal Aljawabra, Marialena Nikolopoulou</i> 1.2.19 Development and Validation of a U-BIM Model For Mitigation of the Urban Heat Island Effect. <i>A.Jain, K.kensek, T.Spiegelhalter, M. Schiler, F. Banaei-Kashani, D.Noble</i> 1.2.20 Applying Numerical Simulation for Wind Availability: Studies of Urban Morphology for Urban Planning in Hong Kong. <i>Law Pui Yin Kathy, Yiu Kam Po Vince, Ng Yan Yung Edward</i> 1.2.21 Solar Energy Potential of Clusters on Sloped Terrains. <i>Patricia Veloso Da Veiga, Mohamed Gadi</i> 1.2.22 Residential Cluster, Ahmedabad: Housing based on the Traditional Pols. <i>Kanika Agarwal</i> 1.2.23 The Users' Perspectives of Performance of Courtyard House Type in the UK. <i>Goh, Ai Tee, Sibley, Magda</i> 1.2.24 Sustainability Principles for the Urban Environmental Rehabilitation: The Case of the City of Manaus, Amazonas, Brazil. <i>Vanessa V. Guilhon, Renan Leite, Marta Bustos Romero</i> 1.2.25 Open Space Planning: Climate and Occupants Perceptions and Behaviour. <i>Virginia M.N. de Vasconcellos, Oscar D. Corbella</i>	
14:50	ORAL PRESENTATION COMMUNITIES <i>Chair : C. Sémidor</i> 1.2.13 Sustainable Urban Block Design Through Passive Architecture: A Tool that Uses Urban Geometry Optimization to Compute Energy Savings. <i>E. Morello, V.Gori, C.Balocco, C.Ratti</i> 1.2.14 Analytical Methods to Enhance Passive Urban Design. <i>Alexej Goehring</i> 1.2.15 Towards "Energy Efficient Cities": Optimising the Energy, Energy and Resource Efficiency of the Demand and Supply Side on Settlement and Community Level. <i>Christina Sager, Dawit Negash</i> 1.2.16 Onsite Energy Yield and Demand in the Urban Built Form: Balancing Yield and Demand to Achieve Zero Carbon Communities. <i>Ian Hamilton, Michael Davies, Philip Steadman</i> 1.2.17 Modelling Domestic Stock Energy Use and Heat-Related Health Risk: A GIS-based Bottom-up Modelling Approach. <i>A.Mavroggianni, M.Davies, Z.Chalabi, P.Wilkinson, M.Kolokotroni.</i>	
16:20	Tea/Coffee, and EDUCATION & HEATING/COOLING Posters @ Chapiteau 1.3.11 Catharine Beecher's Home Designs and Environmental Control Concepts <i>Caroline Morais, Raymond Clark, Robert J. Krawczyk, Harry F. Mallgrave</i> 2.2.30 Comparison of the Effects of Various Countermeasures on Energy Consumption in a Residential Building <i>Takahiro Uemoto, Daisuke Narumi, Yoshiyuki Shimoda</i> 2.2.31 Innovative Systems for Energy Efficient Building Envelopes : Applications at Middle Latitudes (temperate/mesothermal climates) <i>Monica Rossi</i> 2.2.32 Indoor Climate Control Effect of AAC Panel Heat Capacity: Experimental Rooms and Simulations with Three Structural Materials. <i>Y.Tsukiyama, N.Sunaga, A. Suzuki, T. Fukazawa, Y. Chiba.</i> 2.2.33 Alternating, Decentralized, Regenerative Ventilation System <i>Andras Csiba</i> 2.2.34 Study on Reusing Abandoned Chimneys as Solar Chimneys to Induce Breeze in Residential Areas <i>A.Takayama, K.Asano, S.Shuchi, K.Hasegawa</i> 2.2.35 Bioclimatic Strategies for Seaside Resorts on Greek Islands <i>Maria Ampatzi</i> 2.2.36 Towards Environmental - Responsive Electronics Megastores: A Case Study in Markopoulo, Greece <i>Leonidas Belis</i> 2.2.37 Green Walls: Environmental Quality in Buildings <i>Denise Damas de Oliveira Morelli, Lucila Chabel Labaki</i>	
16:40	PLEAnary Session @ Promotion <i>Chair : A. Potvin</i>	
17:40	Opening Cocktail @ Chapelle de l'Amérique française	

Promotion	Amphithéâtre	Réfectoire
07:45	Registration @ Chapiteau and Session Chairs + Keynotes petit-déjeuners @ 1204	
08:30	Keynote Presentation G.Z. BROWN , ESBL, University of Oregon Pleasure and Performance. PETER BUSBY , Busby Perkins + Will Architects Move from Buildings to Communities for the Future of Sustainable Design.	
09:45	Tea/Coffee, and DAYLIGHTING Posters @ Chapiteau 2.1.15 Daylit Spaces and Comfortable Occupants: A Variety of Luminous Ambiences in Support of a Diversity of Individuals. <i>Catherine Dubois, Claude M.H. Demers, André Potvin</i> 2.1.16 Perceptual Interactions Between Light And Architecture: A Graphical Vocabulary Using Models and Photographs. <i>Karole Biron, Claude M.H. Demers</i> 2.1.17 Active Participation in Passive Solar Design: The Poetics of Sustainability. <i>Susan Melsop</i> 2.1.18 The Art of Brightness and Darkness: A Critical Investigation on Daylighting Quality. <i>Wing Lam Lo, Koen Steemers</i> 2.1.19 Daylight Prediction in Atrium Buildings: Measurement, Theoretical Analysis and Simulation. <i>Jiangtao Du, Steve Sharples</i> 2.1.20 Comparative Daylight Glare Analysis Between Measured and Computer Simulation Predictions. <i>Marisela Mendoza</i> 2.1.21 Simulating Complex Window Systems using BSDF Data. <i>Maria Konstantoglou, Jacob C. Jonsson, Elenaor Lee</i>	
10:10	ORAL PRESENTATION DAYLIGHTING <i>Chair : M. Schiller</i> 2.1.1 Daylight and the Occupant: Visual and Physiological Well-Being in Built Environments. <i>Sergio Altomonte</i> 2.1.2 A Study of Luminance Distribution Patterns and Occupant Preference in Daylit Offices. <i>Kevin V.D. Wymelenberg, Mehlika Inanici</i> 2.1.3 A Data Collection Method for Long-Term Field Studies of Visual Comfort in Real-World Daylit Office Environments. <i>Denis Fan, Birgit Painter, John Mardaljevic</i> 2.1.5 A First Application of the Lightsolve Approach: Pre-Design of the New Belgian VELUX Headquarters. <i>C. Cauwerts, M. Bodart, M. Andersen</i>	
12:00	LUNCH @ Chapiteau	

13:00

ORAL PRESENTATION + CMHC WORKSHOP @ 1224

DAYLIGHTING <i>Chair : S. Altomonte</i> 2.1.6 The Model of DSE User Acceptability and Performance: Derivation of New Lighting Recommendation for the Classroom of the Future. <i>Tharinee Ramasoot, Steve Fotios</i> 2.1.7 Towards an Occupant Based Conceptual Model: Case of the Natural Luminous Ambience <i>A. Belakehal, A. Bennadjij, K.T. Aoul</i> 2.1.8 Digital Photography, a Tool for Lighting Research: High Resolution Sampling of Spherical Luminance Maps with Digital Photographic Technologies Applied to Diffuseness Descriptors. <i>Miguel Santa Clara</i> 2.1.9 Daylit Classrooms at 47N, 117W: Insights from Occupation. <i>Judy Theodorson</i> 2.1.10 The Relationship Between Inner Space Features And Daylighting Internally Reflected Component. <i>F.O.R. Perira, R.Fonseca, A. Claro</i>	HEATING/COOLING <i>Chair : U. Janson</i> 2.2.8 Using the landscape for Passive Cooling and Bioclimatic Control: Applications for Higher Density and Larger Scale. <i>Steven A. Sandifer</i> 2.2.9 Chhaya 2.0: Using a Dynamic Balance Point to extend the Passive Season. <i>Vikram Sami, Victor Olgyay</i> 2.2.10 Air Movement Preference and Thermal Comfort: A Survey in Classrooms During Summer Season in Brazil. <i>C. Candido, R. De Dear, R. Lamberts, L. Bittencourt.</i> 2.2.11 Formulating an Alternative Methodology for Singapore's Envelope Thermal Transfer Value Calculation: Accounting for Non-Conventional Shading Strategies. <i>Clarice Fong, Wu Xuchao, Ery Djunaedy</i>
POST-OCCUPANCY EVALUATION <i>Chair : V. Straka</i> 2.3.6 Environmental Satisfaction and Adaptability: The Physical Ambience Rose as a Global Comfort Representation. <i>C.M.H. Demers, A. Potvin, M.C. Dubois</i> 2.3.7 Examining the Interrelationships of Microclimate, Construction Performance and User Behaviour, to Inform Design Strategies. <i>Mary Hancock, Fionn Stevenson</i> 2.3.9 Thermal Performance Evaluation of Low Cost Housing in Santa Maria, Brazil. <i>G. de C. Grigoletti, R. Rotta, S. Muller</i> 2.3.10 Comfort Temperatures Inside Low-Cost Housing: Six Warm Climate Cities in Mexico. <i>G. Gomez-Azpeitia, G.Bojorquez, P. Ruiz, R. Romero, J. Ochoa, M. Perez, O. Resendiz, A. Llamas</i>	

Promotion		Amphithéâtre	Réfectoire
14:30	Tea/Coffee, and HEATING / COOLING Posters @ Chapiteau		
	2.2.22 Environmental Retrofit: Energy Upgrades of Urban Dwellings. <i>Jorge Rodriguez Alvarez</i>		
	2.2.23 Improvement of Energy Performances of Existing Buildings in Suburban Settlements. <i>Aleksandra Krstic-Furundzic, Vesna Kosoric</i>		
	2.2.24 Improvement of Energy Performances of Dwelling Housing in Belgrade. <i>Tatjana Kosic, Aleksandra Krstic-Furundzic, Aleksandar Rajcic, Dusko Maksimovic</i>		
	2.2.25 Perception of Thermal Comfort for Naturally Ventilated High School Classrooms in San Rafael, California. <i>Gwenedd Murray</i>		
14:50	2.2.26 Naturally Ventilated Urban Housing in Southern China: A Research Review on Current Energy Efficient Residential Design Code. <i>Gangrong Lei</i>		
	2.2.27 The Impact of Balconies on Wind Induced Ventilation of Single-sided Naturally Ventilated Multi-Storey Apartment. <i>M.F. Mohamed, D. Prasad, S. King, K. Hirota</i>		
	2.2.28 Designing the Malgaf for Summer Cooling in Low-Rise Housing, an Experimental Study. <i>Shady Attia, André De Herde</i>		
	2.2.29 Thermal Response of Dwellings in Northwest Mexico: Applying Passive Design Strategies. <i>O.A. Preciado Perez, S. A. Fotios</i>		
	ORAL PRESENTATION + CMHC WORKSHOP @ 1224		
14:50	DAYLIGHTING <i>Chair : J. J. Theodorson</i>		
	2.1.11 Examples of Glare Remediation Techniques: Four Buildings. <i>Marc Schiller</i>		
	2.1.12 Colorfulness and Reflectivity in Daylit Spaces. <i>Esther Hagenlocher</i>		
	2.1.13 Improving Daylighting Performance of Mirrored Light Pipes: Passive vs. Active Collection Systems. <i>V.G. Hansen, I.R. Edmonds, J.M. Bell</i>		
	2.1.14 Environmental Shade for Protection from UVR: A Design & Teaching Resource. <i>Christina Mackay</i>		
16:20	HEATING / COOLING <i>Chair : P. LaRoche</i>		
	2.2.12 Exterior Louvers as a Passive Cooling Strategy in a Residential Building: Computational Fluid Dynamics and Building Energy Simulation Modelling <i>A. Tablada J. Carmeliet, M. Baelmans, D. Saelens</i>		
	2.2.13 Low-cost, Passively-Cooled Medicine Warehouses for Hot Climates: A Design and Construction Manual. <i>Gian Luca Brunetti</i>		
	2.2.14 Social Humid Climate: Rica's Warm Humid Climate: Strategies & Considerations for Passive Design. <i>Michael Smith-Masis</i>		
	2.2.15 Analysis of Night Ventilation Potential for Residential Buildings in Hot-Humid Climate of Malaysia. <i>Doris Toe Hooi Chyee, Tetsu Kubota</i>		
16:20	2.2.16 Underground Passenger Comfort: Rethinking the Current Thermal and Lighting Standards. <i>Krista Murray Raines</i>		
	POST-OCCUPANCY EVALUATION <i>Chair : R. Anderson</i>		
	2.3.11 Adaptive Thermal Comfort for Buildings in Portugal based on Occupants' Thermal Perception. <i>L.Matias, S.Almeida, C.Pina Santos, M.Rebelo, M.Correia Guedes</i>		
	2.3.12 Adaptive Thermal Comfort in Warm Dry Climate: Economical Dwellings in Mexico. <i>I.Marincic, J.M.Ochoa, M.G.Alpuche, G.Gomez-Azpetia</i>		
	2.3.13 Thermal Analysis of a Naturally Ventilated Building an Adaptive Comfort Algorithm: A case study of Miele Corporate Headquarters, Johannesburg, Gauteng. <i>C.G. Joubert</i>		
16:20	2.3.14 Analysis of IEQ and User Satisfaction in 20 Office Buildings: Significant Findings to Impact Future Design Standards and Guidelines. <i>Joonho Choi, Vivian Loftness, Azizan Aziz</i>		
	POST-OCCUPANCY EVALUATION Posters @ Chapiteau		
	2.3.19 The Vernacular Dwellings of Mount Pelion in Greece: A Migratory Living Pattern. <i>Natalia Sakarelidou-Tousi, Benson Lau</i>		
	2.3.20 Post-Occupancy Evaluation Study of an Educational Building in Mexico: Occupant's Perception vs. Occupancy Survey. <i>Mundo, J., Valerdi, M., Sosa, J., Arenalde, B.</i>		
	2.3.21 Field and Semi-Field Surveys on Thermal-Environment Experience and Its Associated Acquired Cognition by Family Members, Parents and Children. <i>Nobue Suzuki, Masanori Shukuya</i>		
16:40	2.3.22 Thermal Comfort and Occupant Perception in Dwellings for the Low-Income Sector in Hot Climates of Mexico. <i>Romero, R., Vazquez, E., Bojorquez, G., Valladares, R., Marincic, I., Gomez, C., Macedo, J., Poujol, F., Estrada, J.</i>		
	2.3.23 Evaluation of the Environmental Comfort Conditions in a large Apartment Building: The COPAN Case Study, São Paulo, Brazil. <i>Walter Jose Ferreira Galvao, Sheila Walbe Ornstein</i>		
	2.3.24 Green Space Influence on Thermal Comfort: Contrasting Approaches in the Assessment of Conditions in Bragança (Portugal). <i>Arthur Gonçalves, Antonio Ribeiro, Luis Nunes, Filipe Maia, E Manuel Feliciano</i>		
	2.3.25 Hammāms of North Africa: An Architectural Study of Sustainability Concepts in a Historical Traditional Building. <i>Fodil Fadli, Magda Sibley</i>		
	PLEAnary Session @ Promotion <i>Chair : C.M.H. Demers</i>		
19:00	GALA DINNER* @ Château Frontenac PLEA2009 Awards		
	*Activity non-included in Registration Fees		

Promotion		Amphithéâtre	Réfectoire
07:45	Registration @ Chapiteau and Session Chairs + Keynotes petit-déjeuners @ 1204		
08:30	Keynote Presentation B. KUWABARA, T.AUER, T.GOULDSEBOROUGH, G.KLYM Manitoba Hydro Place Integrated Design Consortium Manitoba Hydro Place : Integrated Design Process Exemplar		
09:30	Tea/Coffee, and DESIGN PROCESS, CERTIFICATION TOOLS, INNOVATIVE MATERIALS Posters @ Chapiteau 3.1.9 An Evolutionary Architecture: Adapted, Interactive, and Effectively Integrated Design. Sandeep Arora, Shweta Saxena 3.1.10 Sustainability as Driver of Architectural Practices: San Francisco Federal Building Case. Maria Gabriela Zapata Poveda 3.2.8 Sizzling Green: Integrated Design Process for Greener Institutional Kitchens. Judhajit Chakraborty, Philip H. Bahr 3.2.9 Proposal for an energy-environmental retrofit and planning procedure for historical centres by means of an energy analysis on a technological scale. Maria Cristina Forlani, Fabrizio Chella 3.3.7 Embodied energy in Wall Subsystems of More Sustainable Buildings. Miguel Alosyo Sattler, Eugenia Aumond Kuhn, Danielle Tubino Pante De Souza 3.3.8 CO2 Emission by Different Building Materials for Walls; Case: Housing in Colima, Mexico. Gabriel Gomez-Azpeitia, Victor Arvizu, Pablo Arena 3.3.9 Life Cycle Energy Analysis of Thermal Insulation: Agricultural Waste Materials in Thailand. Satta Panyakaew, Steve Fotios		
09:45	ORAL PRESENTATION DESIGN PROCESS Chair : C. Brunsgaard 3.1.1 Integrated Design Process: from Analysis/Synthesis to Conjecture/Analysis. Maureen Trebilcock 3.1.2 Barriers to Zero Energy Construction (ZEC) Technically Possible: Why Not Succeed Yet ? Gaby Abdalla, Ger Maas, Jules Huyghe 3.1.3 Adaptive and Interactive Metrics: A Hidden Opportunity in Design-for-Sustainability. Robert J. Koester, Sandeep Arora 3.1.4 The Development of a Tool for Sustainable Building Design: Facilitates Investigation of the Creative Space. Hanne Tine Hansen, Mary-Ann Knudstrup 3.1.5 The Choice of Materials in Architecture: How Ecology Influences our Cognitive and Cultural Schemas ? N. Tornay, F. Bonneaud, L. Adolphe 3.1.6 The First "Comfort Houses" in Denmark: Experiences of Different Design Processes. C. Brunsgaard, M.-A. Knudstrup, P. Heiselberg 3.1.7 New Conceptual Model for Improving Design Team Performance. Alan Harries		
	CERTIFICATION TOOLS Chair : A. Rivera 3.2.1 International Applications of Building Certification Methods: A Comparison of BREEAM and LEED. Angela Rivera 3.2.2 The Morphological Diagram: A Comprehensive Tool for Design and Analysis in Architecture. Claudia Naves David Amorim 3.2.3 POE, EMS, and Building Energy Performance Certificate Implementation at USC, L.A. Thomas Spiegelhalter 3.2.4 Open Stadium Design Aspects for Cold Climates. Agota Szucs, Francis Allard, Sophie Moreau 3.2.5 A Two Stories Office Building Designed for the Southern Brazilian Climate. Marianne Costella 3.2.6 Energy Conservation Improvement of the Existing Building Park, Constraints and Challenges: Case of Granite Traditional Constructions in the United Kingdom. Amar Bennadji, Jonathan Scott, Bruce Taylor		
	MATERIALS & SYSTEMS Chair : M. Utzinger 3.3.1 Climate Controls in a Historic House Museum in the Tropics: A case study of collection care and human comfort. S. Maekawa, C. Carvalho, F. Toledo, V. Beltran 3.3.2 Hybrid Ventilation Systems and High Performance Buildings. Michael Utzinger 3.3.3 Fine-Wire Heat Exchanger Works at Very Low Temperature. J. Kristinsson, A.V.D. Dobbelseen, A.V. Timmeren 3.3.4 Thermal Energy Storage and the Passive House Standard: How PCM Incorporated Into Wallboard Can Aid Thermal Comfort. S. Colclough, P. Griffiths, S. Gschwander 3.3.5 The Carriage House: Renewable Resource Integration of Energy and Water in a Cold Climate. M.R. Yokic, S. Vaughan Gerstle 3.3.6 The Informed Application of Building-Integrated Wind Power. John Breshears, Craig Briscoe		
12:00	LUNCH @ Chapiteau		
13:00	Closing PLEAnary Session @ Promotion Chair : M.-C. Dubois Best Oral/Poster Awards Closing Address		
15:00	SITE VISITS ARCHITECTURAL TOUR* HISTORIC TOUR* For more information on the visits, please refer to p.20 of this program. *Activities non-included in Registration Fees.		

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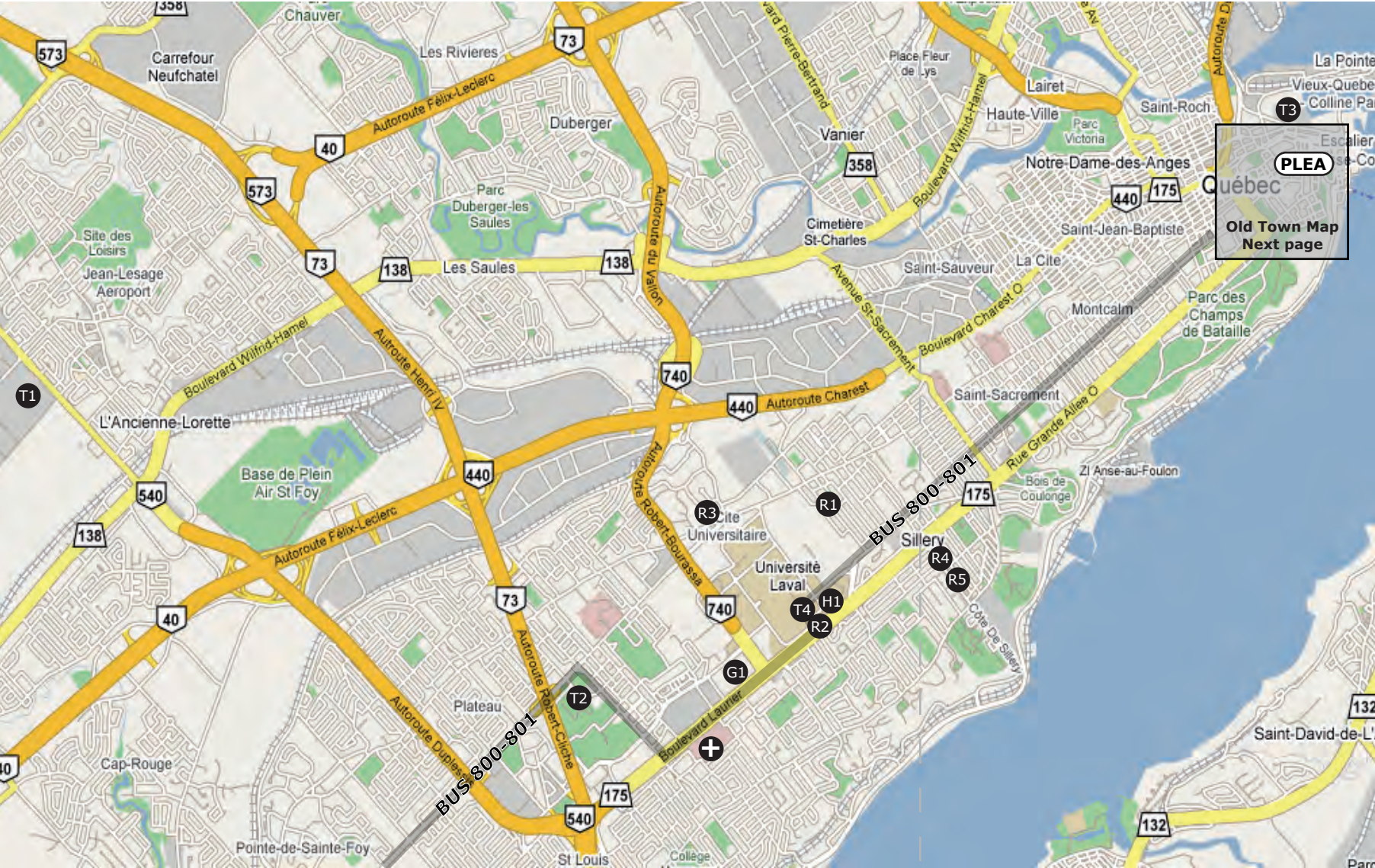
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MAP OF QUEBEC CITY
Including Airport, Bus Stations and the Campus



- PLEA 2009**
- (PLEA)** Vieux-Séminaire de Québec
- HOSPITAL**
- +** CHUL, Québec
- TRANSPORT**
- T1** JEAN LESAGE AIRPORT
T2 BUS STATION, Sainte-Foy
T3 BUS STATION, Downtown
T4 BUS STOP 800-801, Campus
- RESIDENCE**
- H1** Students' Residence, Campus
- EATING OUT near the CAMPUS**
- R1** Café du Temps Perdu, 867 ave. Myrand
R2 Le Pub de l'Université Laval, Pavillon Desjardins
R3 Chez Victor, 2778 chemin Ste-Foy (*in the pyramid*)
R4 Café Bagel Tradition'I, 1332 ave. Maguire
R5 Brynd Smoked Meat, 1360 ave. Maguire
- GROCERY STORES near the CAMPUS**
- G1** Metro, Place Sainte-Foy, 2450 blvd. Laurier.

MAP OF THE OLD TOWN



PLEA 2009

PLEA Vieux-Séminaire de Québec

HOSPITAL

+ Hôtel-Dieu de Québec

BANKS

- B1** Caisse Populaire Desjardins
- B2** Banque Nationale

EATING OUT

Low Prices

- R1** Le Temporel, 25 rue Couillard
- R2** Boulangerie Chez Paillard, 1097 rue St-Jean
- R3** Le Palet D'Or, 60 rue Garneau
- R4** Le Buffet de l'Antiquaire, 95 rue St-Paul

Average Prices

- R5** Les Frères de la Côte, 1190 rue St-Jean
- R6** Le Pain Béni, 24 rue Ste-Anne
- R7** Le Commensale (Vegetarian), 860 rue St-Jean
- R8** Le Petit Coin Latin, 8½ rue Ste-Ursule

Fine Cuisine

- R9** Le Saint-Amour, 48 rue Ste-Ursule
- R10** L'Échaudée, 73 rue du Sault-Au-Matlot
- R11** Laurie-Raphaël, 117 rue Dalhousie
- R12** Aux Anciens Canadiens, 34 rue St-Louis

HOTELS

- H2** Hôtel Le Clarendon
- H3** Hôtel Château-Bellevue
- H4** Hôtel Fairmont Le Château Frontenac
- H5** Auberge Jeunesse (HI)

TRANSPORT

- T1b** Carré d'Youville (Main Bus/Taxi Stop)
- T2b** Couche Tard (bus tickets available here)
- T3** Taxi Stops near the School of Architecture
- T4** Bus Stop 800-801 **going** to Campus.
- T5** Bus Stop 800-801 **arriving** from Campus.

GROCERY STORES

- G1** Marché du Vieux-Port, 160 Quai St-André
- G2** Épicerie de la côte, 48 côte du Palais
- R1** Épicerie de la rue Couillard, beside *Le Temporel*
- G4** Épicerie Richard, 42 rue des Jardins
- G5** SAQ, Wine & Alcohol, 888 rue St-Jean
- G6** SAQ Classique, Selected Wine, 1 rue des Carrières

SOCIAL ACTIVITIES

- H4** Gala Dinner, Château Frontenac
- A1** St-Jean-Baptiste Day
- A2** Open Air Circus
- A3** The Image Mill (can be seen from different places)

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audacieuses

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n'est pas très sage.

VILLE DE
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lieu de création

