

Remote Collaboration: Six Years of the Coast-To-Coast Seminar (C2C) Series

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Abstract: In this paper we describe the *Coast-To-Coast Seminar Series*, a pan-Canadian scientific event that has been running since 2005. We give a short history of the Series; we list various stages of its development and related challenges in communicating complex scientific topics to audiences at a number of remote sites. In particular, we revisit the original goals of the Series and discuss in detail its actual outcomes. We finish by mentioning some present and future applications of our experience as organizers of the C2C series.

Keywords: remote scientific collaboration, distributed seminars and colloquia.

1. The Coast-To-Coast Seminar: Description and History

The Canadian Coast-To-Coast (C2C) Seminar is an hour-long presentation given on a scientific topic and made accessible to audiences at a number of remote sites through collaboration technology. C2C seminars are held every two weeks throughout the academic year alternating between the West Coast and the East Coast of Canada --- each geographic area being broadly interpreted.

Two of the current authors (Drs. Peter and Jonathan Borwein) initiated the C2C Seminar Series in April 2005. During the summer of 2005 a variety of test sessions were conducted and some firm decisions were reached about technical and organizational issues. The first official Coast-To-Coast Seminar was held on Tuesday, September 13, 2005. The speaker was Dr. Jonathan Borwein and the title of his talk was “Mathematical Visualization and other Learning Tools”.

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The main goal of the series has been:



By using the available and emerging technologies, give an opportunity to scientific communities from various Canadian universities to communicate, collaborate and share their interests. Several equally important goals were also stated (see [1]) at the inception of the project:

The Coast to Coast Seminar Series banner

- a. To learn and understand the issues related to the organization and the running of a regular scientific event attended by a large number of universities in different time zones
- b. To set the standards for this type of event for the future
- c. To test the available technology
- d. To motivate the creation of new technological tools and to encourage the improvement of the existing tools
- e. To provide an opportunity to faculties to gain experience with presenting through a still relatively new medium
- f. To educate the audience attending the seminar about the protocols and etiquette involved
- g. To reduce the costs of inviting distinguished speakers
- h. To justify the investment in the technology and in the people involved
- i. To build the C2C community.

The series started as a collaborative project between [the IRMACS Centre](#) at Simon Fraser University, Burnaby, British Columbia, Canada and D-Drive from Dalhousie University, Halifax, Nova Scotia, Canada. Both of groups had been awarded substantial national research funds. Moreover the founders had benefited from significant interaction with groups in Communication and elsewhere [2] and so avoided some avoidable pitfalls. Over the years several major Canadian research

institutions have involved in the organization and in distribution of the C2C Seminar: the Atlantic Association for Research in Mathematical Sciences (AARMS), the Atlantic Computational Excellence Network (ACEnet), SciNet, the Shared Hierarchical Academic Research Computing Network (SHARCNET), and the Western Canada Research Grid (WestGrid) --- see computecanada.org. In Spring 2011 the C2C Seminar Series was available (and attended) at 32 academic institutions; universities, colleges, and institutes, across Canada. We mention that those institutions were located in six different time zones.

The C2C Seminar is simulcast to all sites via video-conferencing software, and each seminar provides opportunities for questions and comments from all of the remote locations. The collaboration technology enables two-way audio and video communication as well as a shared desktop.

Thus a presenter is not only audible and visible to the audience, but can also respond to a raised hand, answer a question, or interact with an individual at a remote site through a shared application. The actual presentation is expected to be of high quality scientifically, yet accessible to a fairly general scientific audience. Accordingly, the seminars are widely advertised and attract audiences from various scientific fields, depending on the presenter's topic. Between the fall 2005 and the spring 2008 the seminar topics were exclusively from mathematics and computing science and talks were not related to each other.



An advertisement for the C2C presentation given by Dr. Pavol Hell from the School of Computing Science, SFU

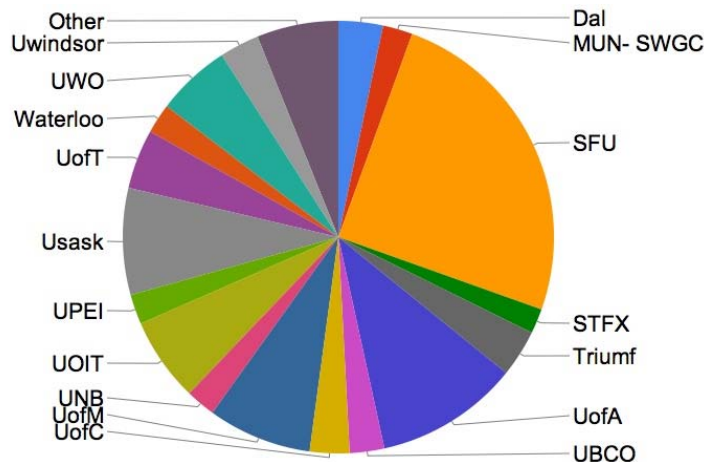
A new concept for the C2C Seminar Series was introduced in the fall of 2008. All six talks were given on the topic of "Computer Visualization and Image Processing". The list of speakers included three computing scientists, an architect, a chemist, and an artist.



An advertisement for the "Artificial Intelligence" C2C session

The next change in the concept of the series was made in the fall of 2009. In consultation with a few SFU faculty members the organizers of the series invited the leading Canadian researchers in the field of "Artificial Intelligence" to speak at the seminar. The topic and the lineup of speakers received significant attention across the country and in the average over one hundred participants attended each presentation.

This success led to another (final?) adjustment of the format in the spring 2010. Dr. Michel C. Vetterli from the SFU Department of Physics and TRIUMF, active in the Atlas project at Cerne, was invited to choose speakers and topics on the theme of "High Energy Physics". Talks covered various aspects of High Energy Physics with the aim to introduce the general scientific public to the current state of the field. The topic and the lineup of six excellent speakers have drawn great interest from across Canada.



Spring 2010 C2C attendance by site



Flyer for the spring 2011 C2C session

2. Goals of Coast-To-Coast Seminar: Six years later

As promised, in this section we comment on the goals of the C2C series that were enunciated at the beginning of the project.

- a. *To learn and understand the issues related to the organization and the running of a regular scientific event attended by a large number of universities in different time zones*

What are the issues related to the organization of the C2C seminar? In the first place there are issues related to the organization of any speaker series:

- Choosing time and dates for presentations,
- Booking the appropriate space,
- Finding and securing the best speakers possible,

This was followed by the theme "The Marine Environment and Climate Change: Problems and Possible Solutions" coordinated by Dr. Keith R. Thompson from Dalhousie University in the fall 2010.

The theme for the spring 2011 was "Economics & Finance: The Global Financial Crisis - The One Constant is Change and it the coordinator of the series was Dr. David McCaughan from the University of Guelph.

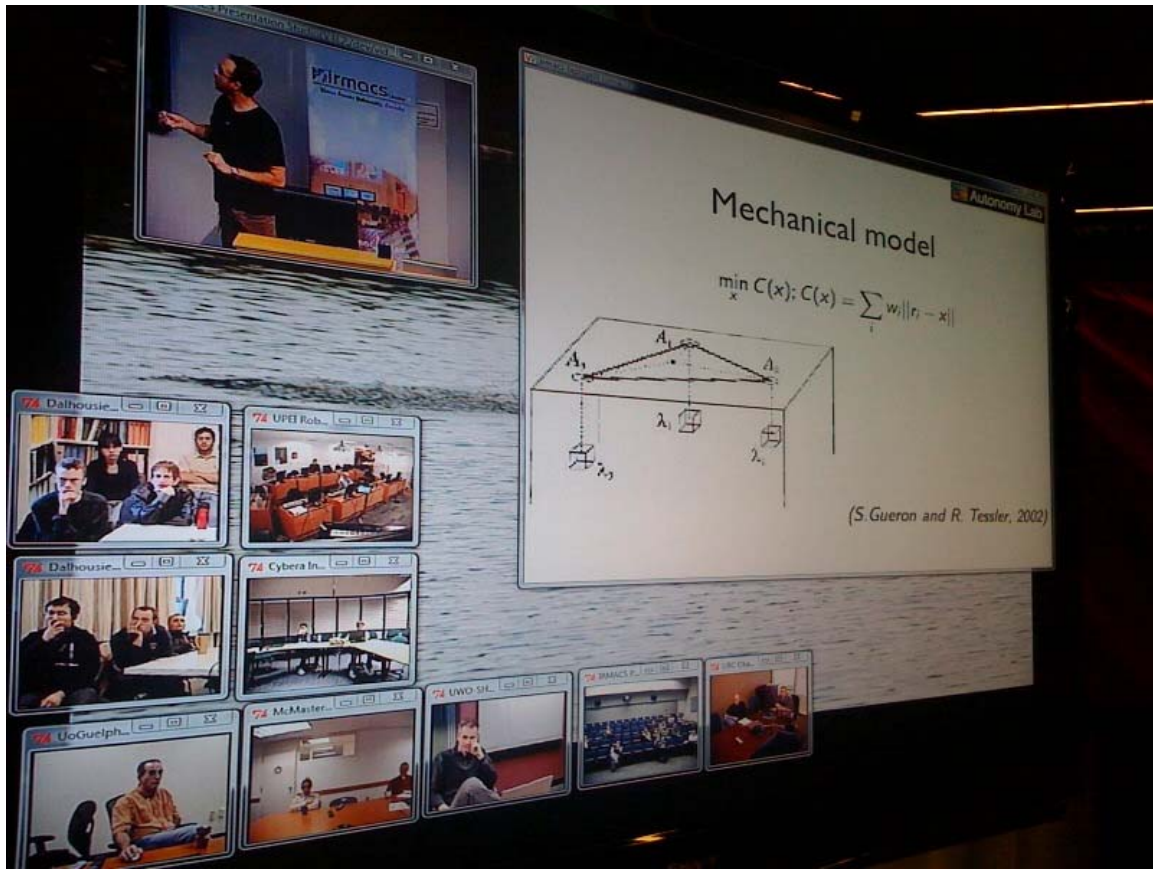
- Obtaining needed administrative, technological and financial support,
- Advertising of the events.

For organizers of even a moderately ambitious speaker series to accomplish all these steps in the best possible way requires good planning, lots of time, patience, and persistence, and a bit of luck.

It should be clear that running the Coast-to-Coast Seminar Series lifts each of the above listed issues into a different dimension. For example, the time of presentations should be chosen to make sense¹ through all six time zones in Canada, rooms at more than 20 Canadian universities should be booked, at least one technician at each site should be present, and so on. Olson and Olson in [5, page 37] claim that

“Technology is never going to repair the disruption in long distance work that different time zones produces. There are several effects. The longer the distance, the fewer work hours overlap, the less time that synchronous interaction can take place.”

¹ At one point there was an initiative to organize a “celebrity” version of the C2C Seminar. The idea was to use the already established C2C network to distribute throughout Canada live presentations, by distinguished speakers, the Nobel prizewinners, for example, from one of the universities involved in the C2C Seminar Series. One of the reasons that the initiative was never realized was the problem of not being able to have control over the time of those presentations and thus not being able to accommodate all C2C sites across the country.



A remote view of a typical C2C presentation

We turn to additional issues related to the organization of the Coast-to-Coast Seminar:

- Technical organization and coordination. This includes a test session usually one day before the presentation. The host site sets up and leads the test session. During the test session and the actual presentation all technicians are connected through an instant messaging system and hence able to do any necessary adjustment.
- Accommodation of technical, space, and administrative capabilities and rules at each site. To host or to attend a C2C session requires a room with particular technical capacities. For a detailed technical overview of the C2C Seminar Series see [1]. Also all sites need to use the compatible set of tools that enable distance collaboration of this type and size. We add here another

equally important, but less obvious, point: the human factor. Each C2C session is a complicated event that requires a team of people with excellent understanding of the technical side of remote collaboration. Our experience fits in what the authors in [4, page 80] call “Technological Readiness”. Here are some of them:

- i. Collaboration technologies provide the right functionality and are easy to use
- ii. Participants are comfortable with the collaboration technologies
- iii. Technologies give benefit to the participants
- iv. Technologies are reliable
- v. Agreement exists among participants as to what platform to use
- vi. Networking supports the work that needs to be done
- vii. Technical support resides at each location
- viii. An overall technical coordinator is in place



Bojan Mohar, Canada Research Chair, presents a C2C Seminar

- Scientific content that raises pan-Canadian interest. This combines finding both a contemporary scientific topic that is of the interest to a significant portion of the Canadian scientific community and a group of the first class Canadian speakers willing to talk on the topic. Since the C2C Seminar Series is owned and run by several Canadian institutions the choice of the topic for the given semester is a joint decision. Once when the topic has been chosen, one of the sites takes the responsibility for coordinating the process of finding speakers.
- Meeting expectations of the audience. It is a fact that present-day audiences have no patience and understanding for any technological or organizational glitches. A less than perfect audio or a slow internet connection for some attendees can spoil the talk given by the best speaker. The organizers of the C2C often face the following two questions, “Will the presentation be web streamed?” and, “Will the presentation be recorded for a post-viewing?” The

problem is that not every hosting site is capable of web streaming or recording presentations and these features are not standard.

- Reaching the potential audience across Canada. This is an activity that involves the whole C2C community. The schedule of the upcoming session is posted on the web² and a poster is created and distributed throughout the C2C community. The community members distribute this information further at their universities to schools, departments, and faculties, which might be interested in the topic. We underline this joint effort by mentioning that in the whole C2C community there is not a single member, a faculty, a technician or an administrator that does advertising of the Seminar as paid part of her or his job.

b. To set the standards for this type of event for the future.

Perhaps the biggest compliment for the organizers of the Coast-To-Coast Seminar Series is that in the view of many faculty members the series is not something *special* anymore and it is judged only by its scientific merit. For those involved in starting the series in 2005 this was one of the implicit goals: Can we run an organizationally very complicated event on a regular basis that would leave the audience concerned only about the scientific relevance of the topic?

c. To test the available technology

Over the last six years the Coast-To-Coast Seminar Series has been a training ground for technicians across the country in the use of distance collaboration technology. The series has given the opportunity to technicians to gain experience at two levels. One is the macro level, i.e., the experience in participating in a large-scale, relatively

² The C2C Seminar website <http://c2c.irmacs.sfu.ca/> contains information about the incoming and past presentations, a list with locations of rooms at various Canadian universities, a brief history of the seminar, basic information about the founders of the series, etc.

short, event on the regular basis. The other is the micro level, i.e., the experience in providing the local audience with the best possible audio, data, and video transmissions of various types of presentations. In addition technicians at each site that host a C2C presenter must be able to coordinate the event at the macro level and to accommodate speaker's needs at the micro level.

d. To motivate the creation of new technological tools and to encourage the improvement of the existing tools

We believe that the Cost-To-Coast Seminar Series would reach even larger audience if various distance communication software were compatible and/or complementary to each other. For example, while preparing the Spring 2010 session of the C2C seminar an issue of the simultaneous use of the Access Grid and the EVO Collaboration Network arose. The discussion on this issue involved a number of people from both communities.

e. To provide an opportunity to faculty members to gain experience with presenting through a still relatively new medium

To prepare and give a scientific talk via remote collaboration technology to the audience that is spread across Canada is a unique experience. The delivery of a C2C talk often depends on the available technology so a dynamic communication³ among the presenter, the organizers, and the local technicians is a necessary part in preparation of a C2C presentation. This implies that speakers have to be open to the possibility of adjusting their usual ways of presenting to accommodate the new medium. We also mention the human factor involved in the process of giving a remote presentation. Facing only the local audience and the camera and talking to a large group of fellow scientists that are elsewhere is a challenge that different

³ Running a series of videos or performing a live experiment or a demo or some other segments of a scientific presentation that work well in single room settings might need multiple testing sessions and adjustments before being used in a C2C talk.

speakers manage with different levels of success⁴. In [2, page 146] Corrie describes this situation in the following way,

“Scientific Media Spaces (SMS) both presents barriers to the collaboration and at the same time provides new opportunities. It is clear that it is necessary for our users to adapt socially to the environment in which they are working. We have found that the level of adaptation is something that is naturally learned, but is learned differently across different users and for different tasks. Some users become adept at using advanced SMS technologies quickly, while others adapt slowly (if at all). The level to which users adapt to these environments can be quite striking, to the point where we have seen collaborating research groups use components of our SMS environments in ways that they were never intended.”

f. To educate the audience attending the seminar about the protocols and etiquette involved

The C2C audience has been steadily growing over the last five years. For example, the total number of attendees for the Spring 2010 session was 559 at 25 sites. This gives the average of about 93 attendees by each of six presentations. To give an equal opportunity to each attendee of a C2C presentation to ask the presenter a question or to participate in the discussion after the presentation is over is a task that needs a high level of coordination. The host site leads the question period and decides in which order the attending sites are invited to ask questions. Usually the first question comes from the local audience. During the question period each site has to have a hand held microphone or a fixed microphone that is available to each attendee. A problem that at the time of writing this note has not been resolved is posting questions by participants who attend a C2C talk by web stream. The fact that, as with any scientific presentation, it is impossible to predict how long a

⁴ While preparing to give a C2C talk, an experienced speaker was repeatedly told by a technician that the audience at remote sites could not see if a laser pointer is used to highlight something on the local screen. Fifteen minutes into the presentation the speaker took a laser pointer from his pocket and used it for the remainder of the talk.

question period will last requires a certain level of flexibility in scheduling the C2C events.

g. To reduce the costs of inviting distinguished speakers

During the last six years the Coast-To-Coast Seminar Series hosted presentations by the world-leading scientists on various topics. Since these presentations came for presenters' home universities no travel or any other extra cost was involved. We wish to underline the willingness of the C2C presenters to participate in the Seminar without any financial compensation. It is our strong conviction that by having renowned Canadian scientists presenting live to an audience across the country contributes, in a relatively low cost way, to the unification of the Canadian scientific space.

h. To justify the investment in the technology and in the people involved

The C2C presentations do not come for free. To be able to hold a series of events of this degree of complexity on a regular basis over several years requires sophisticated and reliable technology, skillful technicians, and committed organizers. Both technological and humane components of the organizational side of the C2C Seminar have been put in place and financed as parts of other, in scale much larger, projects⁵. As Olson and Olson [5, page 36] state

“There are a number of costs to pay, both for obtaining, configuring, and maintaining the technology, for supporting the work itself (e.g., facilitators), and for the lack of satisfaction and increased effort on the part of users. (...)

While distance technologies might on the surface reduce costs, the organizational costs of eliminating travel have been viewed as too high for many.”

The C2C Seminar Series puts in use the available remote collaboration technology, provides a training/practice ground for technicians that manage that technology,

⁵ ACeNet, SciNet, SHARCNET, and WestGrid are multimillion-dollar projects that are providing computational power to researchers and academic institutions in their domains.

and, as a joint project, builds another link among some of the main Canadian computational networks and institutions. We mention that in a few occasions the ability to host or attend the C2C Seminar was the reason to establish (or re-activate) remote collaboration rooms.

i. To build the C2C community

The C2C community includes about 70 presenters, a few thousands attendees, and about one hundred technicians and administrators that have been involved in the C2C Seminar Series over the first six years of the project. In April 2009, the first Coast-To-Coast Retreat titled “Remote Collaboration: Coast-To-Coast Experience & Future Directions” was held in the IRMACS Centre. The main objective of the retreat was “to provide participants with a forum in which to exchange their experiences in delivering remote collaborative events in a scientific context.” The retreat also included discussion of the scientific, technical, and organizational aspects of such events, and discussed future directions in the development of remote scientific collaboration.



Participants of the first C2C Retreat

3. The Future Has Started

The experience and the knowledge accumulated through the organizational and technical sides of the Coast-To-Coast Seminar Series, directly or indirectly, contribute to the ever-changing academic environment. Here we list a few examples.

- Graduate classes shared by multiple academic institutions. In 2008 the IRMACS Centre hosted a stat graduate course for students from three universities, Simon Fraser University, the University of British Columbia, and the University of Washington.

- Conferences held at various locations. In 2009 the Fields Institute, Toronto, Ontario, and the IRMACS Centre, Burnaby, British Columbia hosted a week long Workshop on Discovery and Experimental in Number Theory⁶.
- Since Dr. J. Borwein moved to Australia in 2008, he has initiated a corresponding distributed Optimization Seminar in which the University of South Australia, RMIT in Melbourne, and University of Newcastle share a regular “working seminar.” From time to time this has also included UBC-O and SFU in British Columbia.
- Several shared major conferences have been run. We mention the two most recent examples. In May 2011 the IRMACS Centre hosted “A workshop on computational mathematics in honour of Jonathan Borwein’s 60th birthday”. About a dozen of conference participants⁷ attended the conference from various Australian universities. This included one of conference’s keynote speakers and several contributed talks. The conference was shared between Canada and Australia through the *Access Grid* technology. In August 2011, the IRMACS Centre hosted a joint workshops titled "Our Complex World: Representation, Analysis and Modeling" by the International Cartographic Association (ICA) and the International Society for Photogrammetry and Remote Sensing (ISPRS). In its nature, this was a truly global event. The opening address by the ISPRS representative, a keynote speaker, and a few contributed talks were delivered live from various parts of the world. In this case *Skype Premium* was used for communication. The conference was also web broadcasted live to the members of ICA and ISPRS worldwide.
- There is a corresponding set of 4th year honours mathematics courses shared amongst various departments under the aegis of the [Australian Mathematical Sciences Institute](#).

⁶ <http://www.fields.utoronto.ca/programs/scientific/09-10/FoCM/discovery/index.html>

⁷ The Organizing Committee introduced the category of *remote participants*. The conference fee for remote participants was about 1/2 of the fee paid by participants in Canada.

So to conclude, to accomplish what we have requires both champions and discipline. It requires significant but achievable technical support. Indeed, during the past six years many technical issues have been resolved by improved bandwidth, better software, and a growing sophistication in the community. And placing the receptor sites close the audience makes a huge difference. Curiosity will bring faculty far across campus once or twice but it will not sustain a series unless the content justifies the effort.

In a nut shell, the underlying issues are largely organizational and managerial (see the Appendices to [1]). Above all, we try to “under promise and over deliver.”

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