



Informal AARMS Workshop
March 11-12, 2004
Dalhousie Faculty of Computer Science

Following conversations, Dr Hermann Brunner (AARMS Director) and Dr. Jon Borwein (a newly arrived research Chair in CS at Dalhousie) decided to get together in Halifax on March 11 and 12 (Thursday/Friday) to discuss how Computer Science in Atlantic Canada (not just at Dalhousie) and [AARMS](#) can work together more closely. This will encompass areas like future summer school courses (and/or workshops) and computational issues (both academic and technical). These discussions will also involve Keith Taylor (Dean of Science) and possibly Dr. Breckenridge (VP Research).

Out of town participants include:

Herman Brunner, AARMS Director, MUN
Virendra Bhavsar, Dean of CS, UNB (high performance computing)
Dan Kucerovsky, Math-Stat, UNB (operator algebras)
James Watmough, Math-Stat, UNB (mathematical biology)
Abraham Punnen, Math-Sci, UNB (operations research)
John Bonnett, NRC E-Commerce Lab

Schedule

(4th floor demo room, Faculty of CS, 6050 University Ave)

Thursday March 11, 11.30-12.30: Robby Robson, Oregon and EduWorks, *Digital Rights Management in the Academy* **Colloquium**, Main Theatre

Abstract: Authors want attribution, publishers want copy protection and most people just want to use what they find. Intellectual property laws differ from country to country and are becoming evermore complex. Meanwhile, the academy is investing in digital repositories with the expectation that content will eventually be widely shared and reused within and across institutional and national boundaries. If this is to happen, something must be done about managing rights. But what?

Traditional digital rights management associated with commercial music, video and e-books focuses on protection rather than sharing. It does not address issues critical to the academy such as allowing fair use, enforcing scholarly attribution, and supporting open source development and distribution models. However, new approaches that show more promise are emerging and being prototyped. We will describe these approaches and examine how they are clarifying the rights management requirements of the academy. We will look at what is being done, what might work, what probably won't work, and where there are gaps to fill.

Biographical Sketch: Robby Robson is PI of the National Science Digital Library reusable learning project, chair of the IEEE Learning Technology Standards Committee and president of Eduworks Corporation. He is an internationally known innovator, researcher and strategist in e-learning and e-learning technology, spanning the education, research and commercial worlds.

2.00-4.00: **Brief Research Presentations** by AARMS members (Abstracts are below)
2.00-2.35: Dan Kucerovsky, *Algebraic topology of non-commutative spaces*
2.40-3.15: Richard Wood, *Complete Distributivity*
3.20-3.50: Jon Borwein, *Maximizing surprise*

4.00-5.30: Dalhousie **Collaborative and Distributed Research Initiative** Seminar (Room 311)
Andrew Rau-Chapman speaks on *The LaHave House Project*

6.30, No Host **Dinner**

Friday March 12. 9.00-10.00: Jon Borwein, Presentation and demonstration of
Advanced Collaborative Environments for Mathematical and Computational Sciences

10.00-12.00: Discussion of opportunities for technology based collaboration in AARMS and AceNet.

Lunch at Faculty Club

2.00-5.00: Next steps (Keith Taylor will join us)

6.00: **Dinner** for participants at Jon and Judi Borwein, 857 Bridges.

Abstracts

Dan Kucerovsky. *The algebraic topology of non-commutative spaces*

We introduce C^* -algebras as generalizations of topological spaces. The key notion of Kasparov theory is the absorbing extension, which appears to be the proper non-commutative counterpart of the classical concept of a loop in $\pi_1(X)$, the fundamental group. We attempt to indicate some applications.

RJ Wood. *Complete Distributivity (CD)*

Even basic theorems about (CD) lattices depend on the axiom of choice (AC). In the early 90's, Fawcett and Wood formulated the definition of constructively completely distributive (CCD) lattices for which the corresponding theorems avoid choice. In fact they proved $(AC) \iff (CD \iff CCD)$. I will explain how the (CCD) idea illustrates 'less is more' in constructive mathematics.

Jon Borwein: *Maximizing Surprise*

The Surprise Examination or Unexpected Hanging Paradox has long fascinated mathematicians and philosophers, as the number of publications devoted to it attests. In this talk, the optimization problems arising from an information theoretic avoidance of the Paradox are examined and solved. They provide a very satisfactory application of both the Kuhn-Tucker theory and of various classical inequalities and estimation techniques. Although the necessary convex analytic concepts are recalled in the course of the talk, some elementary knowledge of optimization is assumed. Those unfamiliar with this background may simply ignore a couple of proofs and few technical details.

This is joint work with D. Borwein (UWO) and P. Marechal (Montpellier). Our joint paper appeared in the *MAA Monthly* and is available at www.cecm.sfu.ca/preprints/1998pp.html#116