Department of
Mathematics and Statistics

Peter Selinger
Professor
Tel: 902-494-3311
Fax: 902-494-5130
selinger@mathstat.dal.ca

AARMS
Attn: David Langstroth, Executive Administrator
Room 205, Faculty of Computer Science
Dalhousie University
6050 University Avenue
Halifax, Nova Scotia
CANADA B3H 4R2

September 12, 2012

Workshop on Foundational Methods in Computer Science
Invoice #002

Date	Description	Quantity	Unit Price	Total
June 14-17, 2012	20th Workshop on Foundational Methods in Computer Science (FMCS 2012)	1	CAD 2,500.00	CAD 2,500.00
Amount Due				**CAD 2,500.00**

Payment terms: 30 days. Please pay by journal entry to Dalhousie account #68838 ("FMCS 2012").

Thank you for your support. A detailed financial report is attached. Expense reimbursements have been completed and all original source documents (travel claims, itemized receipts, etc.) have been filed with Dalhousie University Financial Services.

I am also attaching a verbal report on the workshop, the program, and a list of participants, as requested.

Sincerely,

Peter Selinger

20th Workshop on Foundational Methods in Computer Science (FMCS 2012)

Dalhousie University, Halifax, Canada
June 14-17, 2012

Report

FMCS 2012 was held in the Department of Mathematics and Statistics at Dalhousie University from June 14-17, 2012. It is an annual workshop bringing together researchers in mathematics and computer science with a focus on the application of category theory in computer science. This year's workshop was organized by Dorette Pronk and Peter Selinger (Dalhousie).

The scientific program consisted of four invited tutorials aimed at students and newcomers to category theory, as well as two and a half days of research talks. The tutorials were given by Robin Cockett (Calgary), Peter LeFanu Lumsdaine (Dalhousie), Ernie Manes (Massachusetts), and Simona Paoli (Leicester). There was also a special session in honor of Robin Cockett's 60th birthday. The special session organizers are Rick Blute, Pieter Hofstra, and Robert Seely. In total, the workshop contained 22 talks. Slides from some of the talks are available on the workshop website, http://www.mathstat.dal.ca/~selinger/fmcs2012/.

Among the scientific highlights was a sequence of lectures on connections between type theory and homotopy theory, delivered by Simona Paoli (Leiceister), Peter LeFanu Lumsdaine (AARMS Postdoc), and Laura Scull (Fort Lewis). Princeton is holding a special year on these topics in 2012/13.

The social program consisted of an opening reception on Thursday, a conference dinner on Friday, and an excursion on Saturday afternoon.

The workshop had 30 participants, including 7 students and 6 postdocs. Funding was provided by AARMS, as well as the Dalhousie Administration and Dalhousie's Faculty of Science.

Foundational Methods in Computer Science For Period Covering 01/01/2012 to 12/31/2012

Revenues

Income

AARMS	$2,500.00	
Dalhousie Faculty of Science	$1,000.00	
Dalhousie President's Office	$2,500.00	
Registration	$2,347.92	
Research Grants	$321.34	
Total *Income*		$8,669.26

Total Revenue   **$8,669.26**

Expenses

Expenses

Coffee breaks and reception		$775.56
Conference Dinner		$966.36
Credit Card Fees		$18.81
Invited Speakers		
Lumsdaine	$86.96	
Manes	$777.45	
Paoli	$793.74	
Total *Invited Speakers*		$1,658.15
Registration Fee Reductions		
Researchers without Grant	$230.45	
Retired	$173.92	
Students	$695.68	
Total *Registration Fee Reductions*		$1,100.05
Student Support		
Chakraborty	$690.32	
Gallagher	$515.79	
Giles	$684.51	
Nester	$683.24	
O'Neill	$196.15	
Santamaria	$690.00	
Yeasin	$690.32	
Total *Student Support*		$4,150.33
Total *Expenses*		$8,669.26

Total Expenses   **$8,669.26**

Net income for Period $0.00

2010 Category Theory Octoberfest
Dalhousie University, Halifax, Canada
October 23–24, 2010

List of Participants

Regional:

Robert Dawson, Saint Mary's
Jeff Egger, Dalhousie **
Alexander Green, Dalhousie **
Peter LeFanu Lumsdaine, Dalhousie **
Micah McCurdy, Dalhousie **
Bob Paré, Dalhousie
Dorette Pronk, Dalhousie
Robert Rosebrugh, Mount Allison
Peter Selinger, Dalhousie

National/International:

Subashis Chakraborty, Calgary *
Robin Cockett, Calgary
Geoff Cruttwell, Ottawa **
Jonathan Gallagher, Calgary *
Brett Giles, Calgary *
Willem Heijltjes, LIX **
Pieter Hofstra, Ottawa
John MacDonald, UBC
Ernie Manes, Massachusetts
Francisco Marmolejo, UNAM
Philip Mulry, Colgate
Chad Nester, Calgary *
Susan Niefield, Union
Keith O'Neill, Ottawa *
Simona Paoli, Leicester
Fanny Santamaria, Ottawa *
Phil Scott, Ottawa
Laura Scull, Fort Lewis
Robert Seely, McGill
Takeo Uramoto, Kyoto *
Masuka Yeasin, Calgary *

* = Student
** = Postdoc

Foundational Methods in Computer Science 2012

Dalhousie University, Halifax, Canada
June 14–17, 2012

Program

Wednesday, June 13

5:30 – 8:00:	Welcome reception, 319 Chase Building

Thursday, June 14

8:30 – 9:00:	Coffee and Breakfast
9:00 – 9:45:	Ernie Manes (Massachusetts): *More work for Robin: Universal algebra in everyday programming logic, and concomitant challenges for restriction categories (part 1)*
9:45 – 10:30:	Takeo Uramoto (Kyoto): *On Tannaka dualities*
10:30 – 10:55:	Break
10:55 – 11:40:	Willem Heijltjes (LIX): *Proof nets and semi-star-autonomous categories*
11:40 – 12:25:	Keith O'Neill (Ottawa): *Differential Forms for T-Algebras in a Kahler Category*
12:25 – 2:00:	Lunch
2:00 – 2:45:	Ernie Manes (Massachusetts): *More work for Robin: Universal algebra in everyday programming logic, and concomitant challenges for restriction categories (part 2)*
2:45 – 3:30:	Subashis Chakraborty (Calgary): *The proof theory of message passing with protocols*
3:30 – 3:55:	Break
3:55 – 4:40:	Masuka Yeasin (Calgary): *Linear functors and their fixed points*
4:40 – 5:25:	Bob Paré (Dalhousie): *Colimits and Profunctors*

Friday, June 15

8:30 – 9:00:	Coffee and Breakfast
9:00 – 9:45:	Robin Cockett (Calgary): *Can you differentiate a polynomial? (part 1)*
9:45 – 10:30:	Robert Seely (McGill): *Towards a notion of Cartesian differential storage category*
10:30 – 10:55:	Break
10:55 – 11:40:	Brett Giles (Calgary): *Linear Quantum Programming Language (LPQL) and implementing a Quantum Stack*
11:40 – 12:25:	Susan Niefield (Union): *A double approach to variation for bicategories*
12:25 – 2:00:	Lunch

2:00 – 2:45:	Geoff Cruttwell (Ottawa):
	Differential structure, tangent structure, and SDG
2:45 – 3:30:	Jonathan Gallagher (Calgary):
	Differential combinatory algebras
3:30 – 3:55:	Break
3:55 – 4:40:	Philip Mulry (Colgate):
	An Overview of Some Categorical Approaches to Computation
4:40 – 5:25:	Pieter Hofstra (Ottawa):
	Isotropy and Crossed Toposes
5:25 – 5:40:	Ernie Manes (Massachusetts):
7:00 – :	Dinner

Saturday, June 16

8:30 – 9:00:	Coffee and Breakfast
9:00 – 9:45:	Simona Paoli (Leicester):
	Categorical models of homotopy types (part 1)
9:45 – 10:30:	Laura Scull (Fort Lewis):
	Equivariant homotopy and diagram categories
10:30 – 10:55:	Break
10:55 – 11:40:	Jeff Egger (Dalhousie):
	A categorical look at Fourier transforms
11:40 – 12:25:	Peter LeFanu Lumsdaine (Dalhousie):
	Fibrations as Types — a categorical road to intensional type theory (part 1)
12:25 – 2:00:	Lunch
2:00 – 2:45:	Simona Paoli (Leicester):
	Categorical models of homotopy types (part 2)
3:00 – :	Excursion/Hike/free afternoon

Sunday, June 17

8:30 – 9:00:	Coffee and Breakfast
9:00 – 9:45:	Peter LeFanu Lumsdaine (Dalhousie):
	Fibrations as Types — a categorical road to intensional type theory (part 2)
9:45 – 10:30:	Micah McCurdy (Dalhousie):
	Introduction to Adiabatic Quantum Computing
10:30 – 10:55:	Break
10:55 – 11:40:	Francisco Marmolejo (UNAM):
	No-iteration pseudomonads
11:40 – 12:25:	Robin Cockett (Calgary):
	Can you differentiate a polynomial? (part 2)
12:25 – 2:00:	Lunch