

People. Discovery. Innovation.
Les gens. La découverte. L'innovation.



Natural Sciences and Engineering
Research Council of Canada

Conseil de recherches en sciences
naturelles et en génie du Canada

Canada

2012 Research Grants Competition

Computer Science Evaluation Group (1507)

Presentation to Heads and Chairs

Annual Meeting of the Canadian Association of Computer Science
May 17, 2012 – Waterloo, ON



French version is available



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Session's Outline

- General Context of 2012 Competition
- Computer Science Evaluation Group
- Overview of the Discovery Grants Competition Process
- Discovery Grants Competition Results
- Discovery Accelerator Supplements Competition
- Research Tools and Instruments Competition

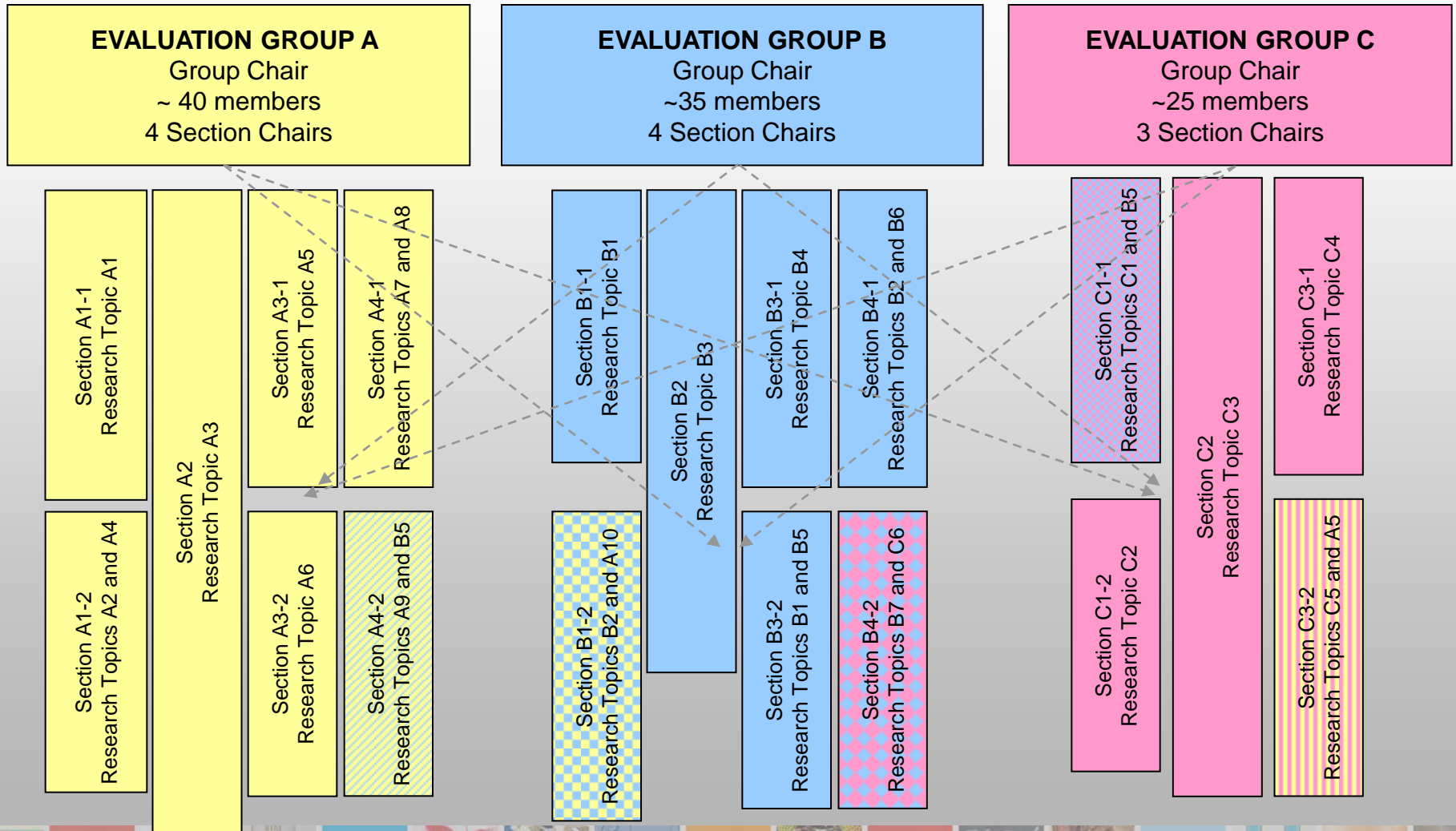
2012 Discovery Grants Competition

General Context

- Third year of implementation of Conference model, as recommended by the Grant Selection Committee Structure Review.
 - 12 Evaluation Groups.
 - Flexible composition of Sections to ensure comprehensive review of applications.
 - Members from different Evaluation Groups joined various Sections to review applications covering topics that cross the traditional boundaries between disciplines.

Conference Model

Overview



Conference Model

How It Works

- Inside an Evaluation Group, applications are assessed within Sections.
 - Reviewers are drawn from the Evaluation Group’s membership as a function of the members’ expertise and the need to ensure balanced reviews.

- Members from different Evaluation Groups could participate in the review of any application, if required to ensure a comprehensive review.
 - Joint reviews.
 - Primary Evaluation Group: leads the review (“home” of application).
 - Secondary Evaluation Group(s): provides expert reviewer(s).
 - Reviewer(s) from secondary Evaluation Group(s): among the five reviewers assessing the application (full assessment, participation in deliberations, and vote).

List of Evaluation Groups

- Genes, Cells and Molecules (1501)
- Biological Systems and Functions (1502)
- Evolution and Ecology (1503)
- Chemistry (1504)
- Physics (1505)
- Geosciences (1506)
- **Computer Science (1507)**
- Mathematics and Statistics (1508)
- Civil, Industrial and Systems Engineering (1509)
- Electrical and Computer Engineering (1510)
- Materials and Chemical Engineering (1511)
- Mechanical Engineering (1512)

2012 Discovery Grants Competition

General Context

- Two-stage review process as recommended by the International Review of the Discovery Grants Program.
 - In the first step, the Evaluation Group assesses and rates the merit of each application based on three selection criteria, consistently using the evaluation indicators.
 - The ratings lead to the grouping of applications into categories ("bins") of comparable overall merit.
 - In the second step (once all deliberations are completed), the Executive Committee balances the amounts to be awarded to the merit bins in relation to the number of applicants funded. This is done at the *global bin level* and no specific application is singled out or discussed.

2012 Discovery Grants Competition

General Context

- Evaluation Groups do not make direct funding recommendations for any individual application.
- Process separates the merit assessment from the funding recommendation.
- Merit assessment of applications decoupled from the previous grant held by applicants.
- Applicants, new and established, with superior contributions are recognized and awarded funding at appropriate level, within the context of a competition with a constrained budget.
- A more dynamic system.

Computer Science Evaluation Group (1507)

2012 Membership

- Evangelos Milios (Group Chair)
Dalhousie University
- Robert Bridson (Section Chair)
University of British Columbia
- Juergen Dingel (Section Chair)
Queen' s University
- Mario Nascimento (Section Chair)
University of Alberta
- Srinivas Bangalore
AT&T Labs Research
- Brahim Chaib-draa
Université Laval
- Rama Chellappa
University of Maryland
- Laurence Cuthbert
Université Laval
- Amy Felty
University of Ottawa
- Russell Greiner
University of Alberta
- Mike Hinchey
University of Limerick
- Xiangji (Jimmy) Huang
York University
- Ahmed Kamal
Iowa State University
- Arthur Kordon
Dow Chemical Company

Computer Science Evaluation Group (1507)

2012 Membership

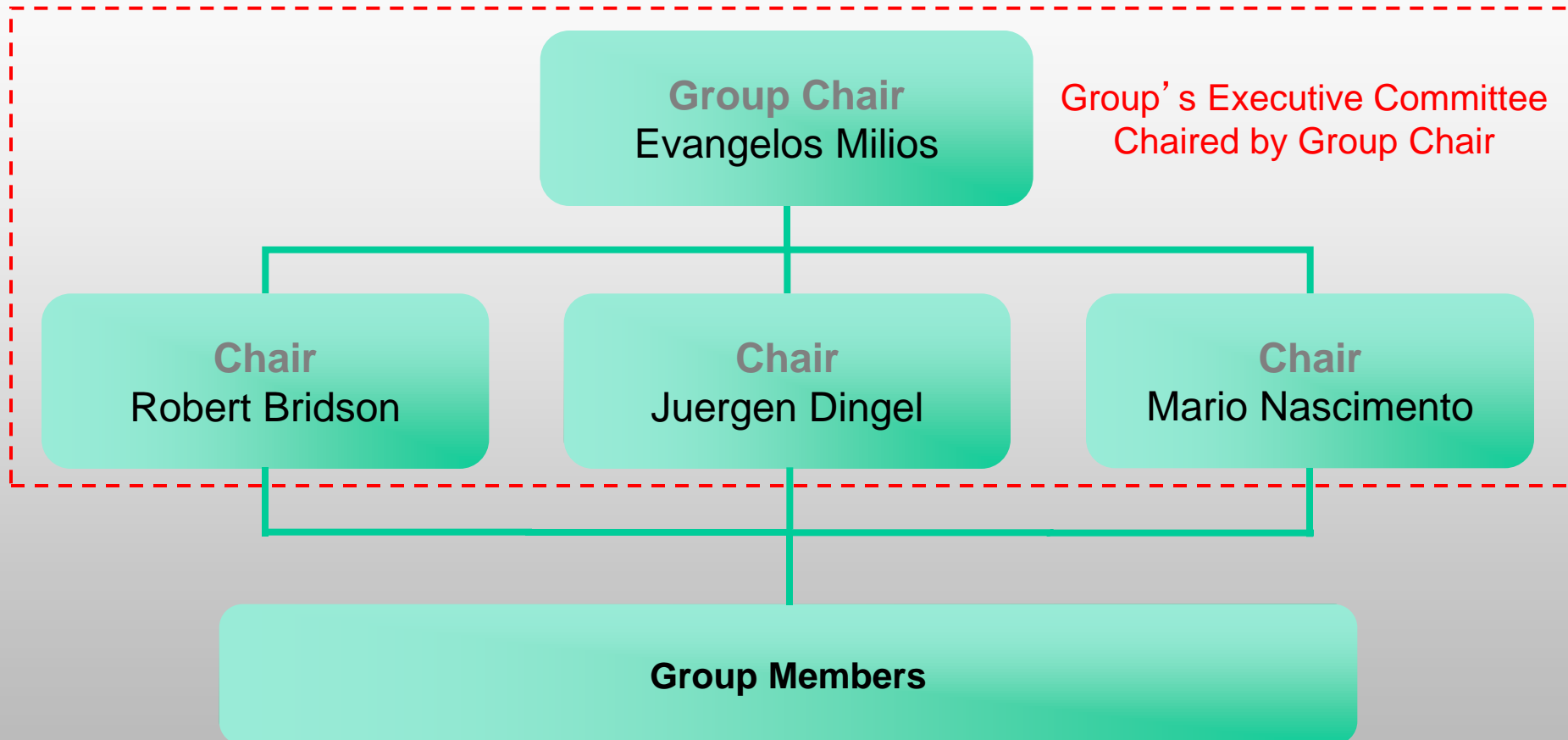
- James Lester
North Carolina State University
- Sophie Laplante
Laboratoire de Recherche en Informatique
- James Lester
North Carolina State University
- Luigi Logrippo
Université du Québec en Outaouais
- Anna Lubiw
University of Waterloo
- Peter Marbach
University of Toronto
- George Mihaila
Google, Inc.
- Torsten Möller
Simon Fraser University
- Parvin Mousavi
Queen's University
- Jian Yun-Nie
Université de Montréal
- Dorina Petriu
Carleton University
- Frank Piessens
Katholieke Universiteit Leuven
- Makan Pourzandi
Ericsson Canada Inc.
- Doina Precup
McGill University

Computer Science Evaluation Group (1507)

2012 Membership

- Przemyslaw Prusinkiewicz
Calgary University
- Vijaya Ramachandran
University of Texas at Austin
- mc schraefel
University of Southampton
- Alain Tapp
Université de Montréal
- Hans Vangheluwe
McGill University
- Shengrui Wang
Université de Sherbrooke
- Kaizhong Zhang
University of Western Ontario

Organization of Contributors to the Peer Review Process – EG 1507



Group's Executive Committee
Chaired by Group Chair

Group Chair
Evangelos Milios

Chair
Robert Bridson

Chair
Juergen Dingel

Chair
Mario Nascimento

Group Members

Research Topics and Sections in EG 1507

SECTION - COMPUTER APPLICATIONS

- CS 01 - Web-enabled Applications & Services
- CS 08 - Information Systems
- CS 10 - Data Management
- CS 16 - Web-based Systems

SECTION - COMPUTER METHODOLOGIES

- CS 02 - User Adaptive Systems
- CS 17 - Human Computer Interaction
- CS 18 - Artificial Intelligence
- CS 19 - Computer Graphics & Visualization
- CS 21 - Computer Vision & Robotics

SECTION - COMPUTER SYSTEMS

- CS 06 - Computer Networks
- CS 09 - Security & Privacy
- CS 11 - Programming Languages
- CS 12 - Software Engineering
- CS 13 - Formal Methods
- CS 14 - Computing Systems
- CS 15 - Parallel and Distributed Computing

SECTION - THEORETICAL COMPUTER SCIENCE

- CS 03 - Mathematical Computing
- CS 04 - Theory of Computing
- CS 05 - Algorithms and Data Structures
- CS 07 - Quantum Computing
- CS 20 - Bioinformatics & Bioinspired - Computing

Major Pre-Competition Activities

2012 Discovery Grants Competition

▪ August

- Applicants submitted Form 180, *Notification of Intent to Apply*.
- Orientation material provided to members.

▪ September - October

- Members provided comfort ratings to review each application.
- Preliminary assignment of applications to Sections was made.
- Chairs held teleconferences:
 - To confirm assignment of applications to Sections.
 - To assess need to seek/offer additional expertise from/to other EGs for each application and discuss possible transfers to/from other EGs.
- Chairs identified 1st internal reviewer for each application.
- First internal reviewers selected 5 external referees for each application.
- NSERC contacted external referees (all 5 for each application) to probe their willingness to participate; followed-up with first internal reviewers if additional names were needed.

Major Pre-Competition Activities

2012 Discovery Grants Competition

■ November / December

- Chairs' meeting in Ottawa (November 19, 2011) – Based on the full proposals:
 - Determined the most appropriate Evaluation Group to take the lead for the review of a certain number of applications.
 - Finalized the Section assignment of a few applications within the Computer Science Evaluation Group.
- New members' orientation meeting in Ottawa (November 20, 2011).
- Assignment of 2nd internal reviewer and additional 3 readers (to add to 1st internal reviewer) for each application – 5 internal reviewers in total.
- Establishment of competition schedule.
- Applications and assignments provided to members.

Organization of Competition Week

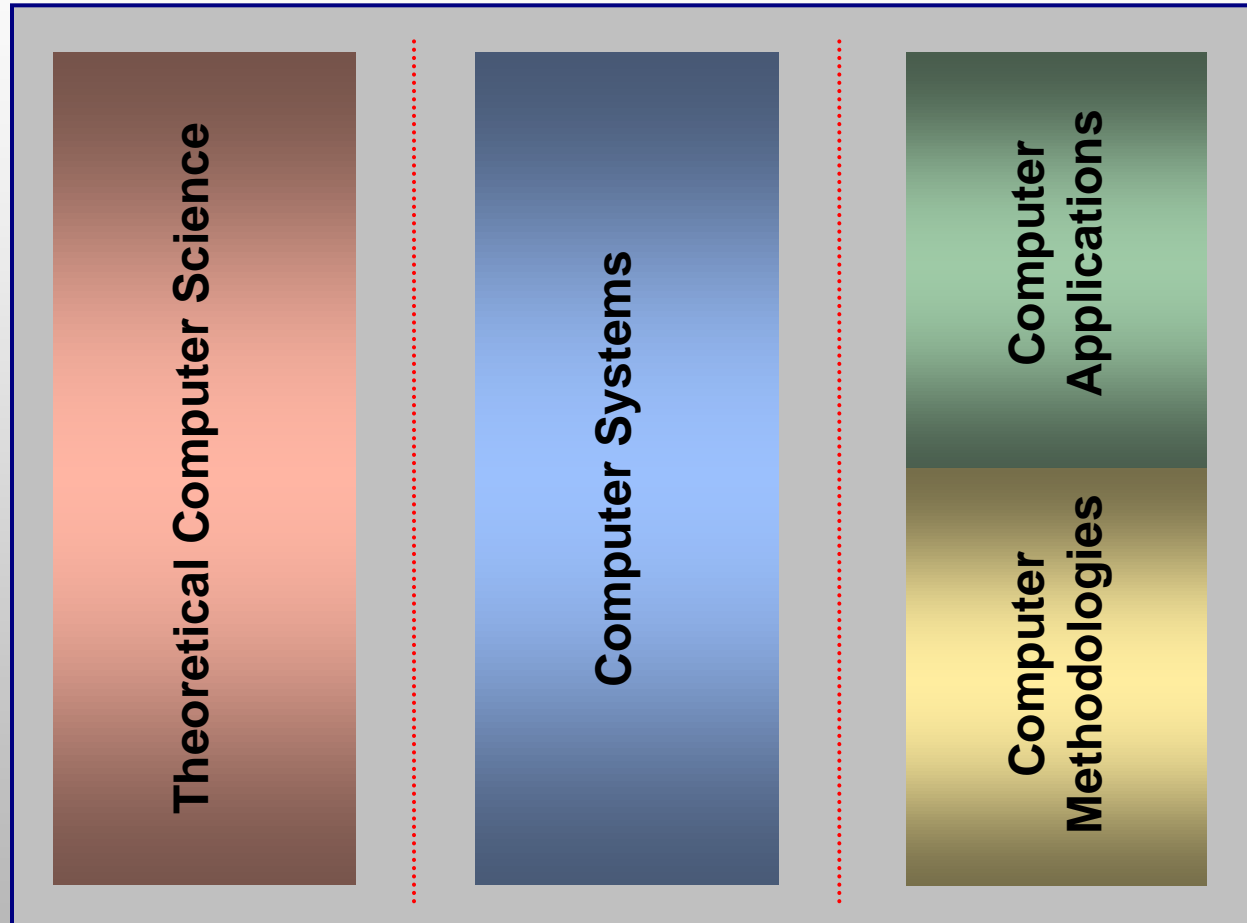
2012 Discovery Grants Competition

- Monday, Feb. 6th to Friday, Feb. 10th
 - Orientation.
 - Review of Discovery Grants applications.
 - Policy meeting.
- Saturday, Feb. 11th
 - Executive Committee meeting.

Organization of Competition Week

2012 Discovery Grants Competition

Conference
model
with **parallel**
streams



Schematic representation of the Streams organization

Overall Statistics (**All EGs**)

2012 Discovery Grants Competition

	Success rate (%)	Average Grant
Early-Career researchers (ECR)	62	\$26,740
Established researcher (ER) applicants who held a grant	78	\$33,354
Applicant not previously holding a grant ¹	36	\$26,964

1. Includes returning unfunded applicants and experienced researchers submitting a first application

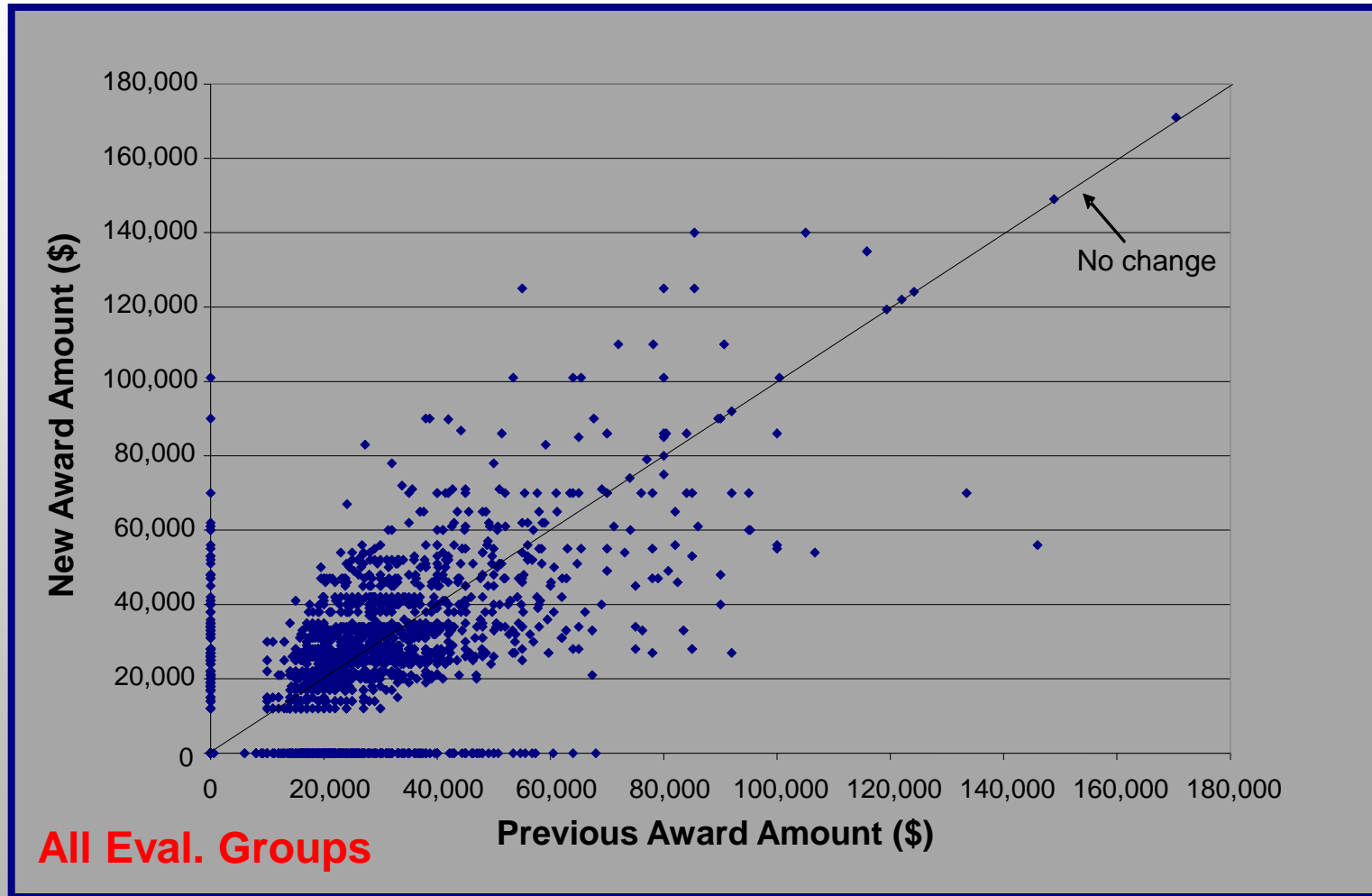
- 3,477 applications in total.
- Going into the competition, there were 1,874 renewal applicants who held grants of, on average, \$30,139; after the competition, there are 2,161 funded researchers at an average grant level of \$31,244.

Overall Statistics (All EGs)

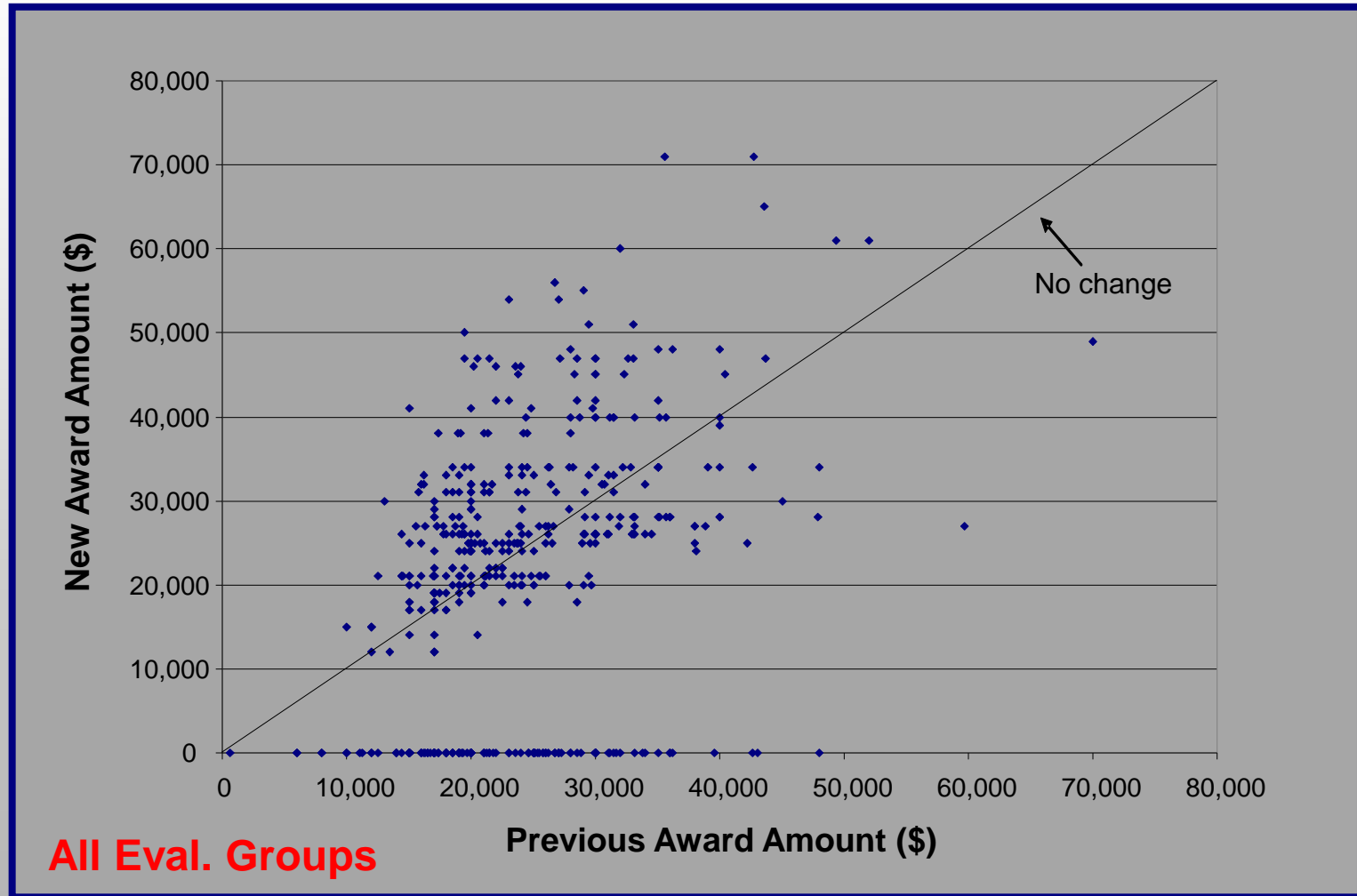
2012 Discovery Grants Competition

- NSERC continued to put a strong emphasis on giving Early-Career Researchers (ECRs) a chance to demonstrate their potential and exceeded the minimum target success rate of 50% recommended in the International Review of the NSERC Discovery Grants Program.
- In *Budget 2011*, NSERC was allocated additional funding "to support outstanding research in the natural sciences and engineering fields, such as the Strategy for Partnerships and Innovation (SPI)." NSERC is devoting half of this money to enhance the Discovery Grants of ECRs in the form of supplements to their grants.
- These supplements of a value of up to \$5,000 per year are included in the awarded amounts and reflected in the statistics presented in these slides.

Change in Grant Level for all Est. Researchers 2012 Discovery Grants Competition



Change in Grant Level for all 1st Renewals 2012 Discovery Grants Competition



Results and Statistics – Computer Science

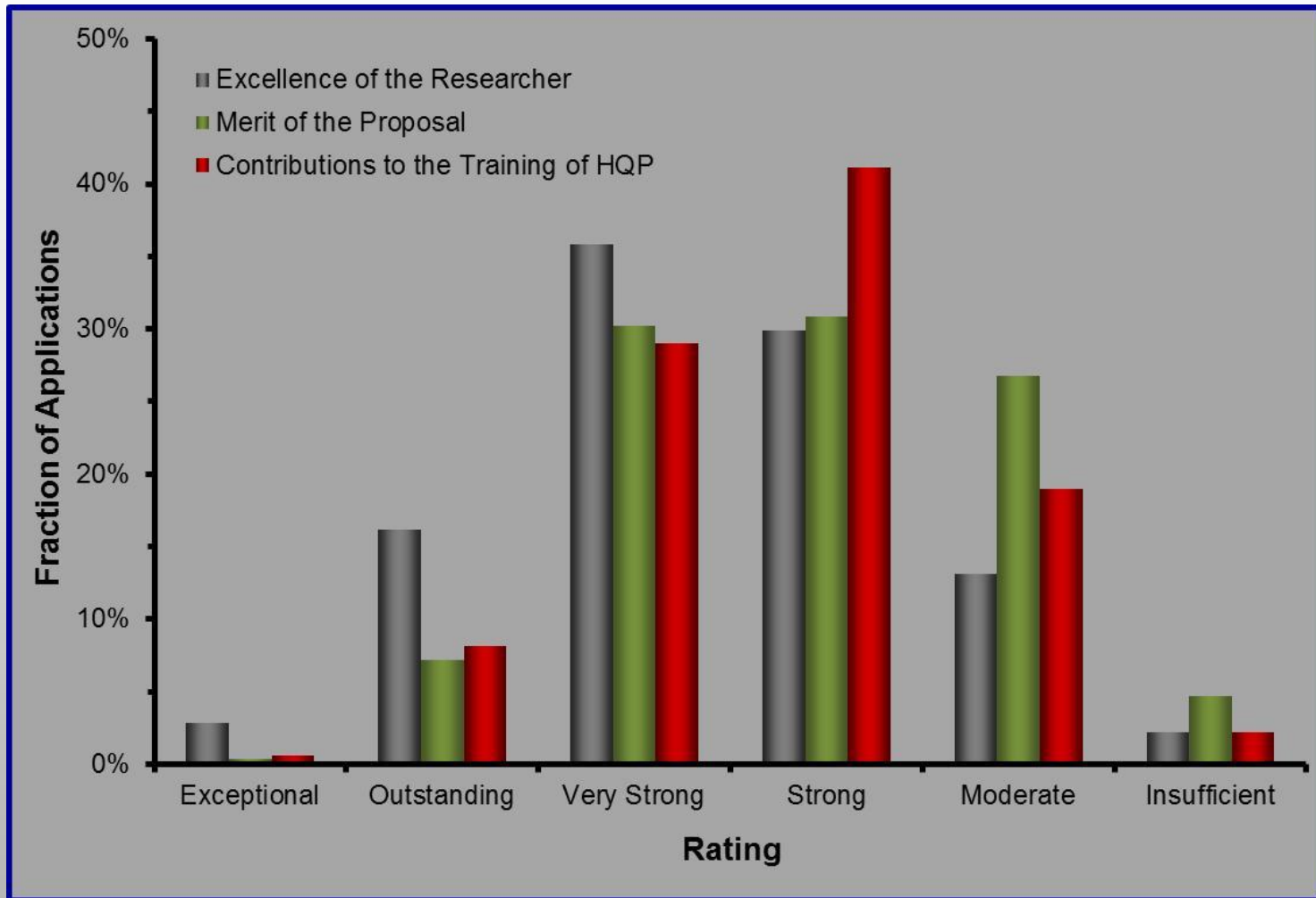
2012 Discovery Grants Competition

Discovery Grants	Early-Career Researchers	Established Researchers Renewals	Established Researchers Not Holding a Grant
Number of Applications	34	213	73
Number of Awards	23	180	28
Success Rate	68%	84.5%	38%
Average Grant	\$21,609	\$27,966	\$17,214
Total Budget	\$497,000	\$5,033,920	\$482,000

Overall S/R: 72%

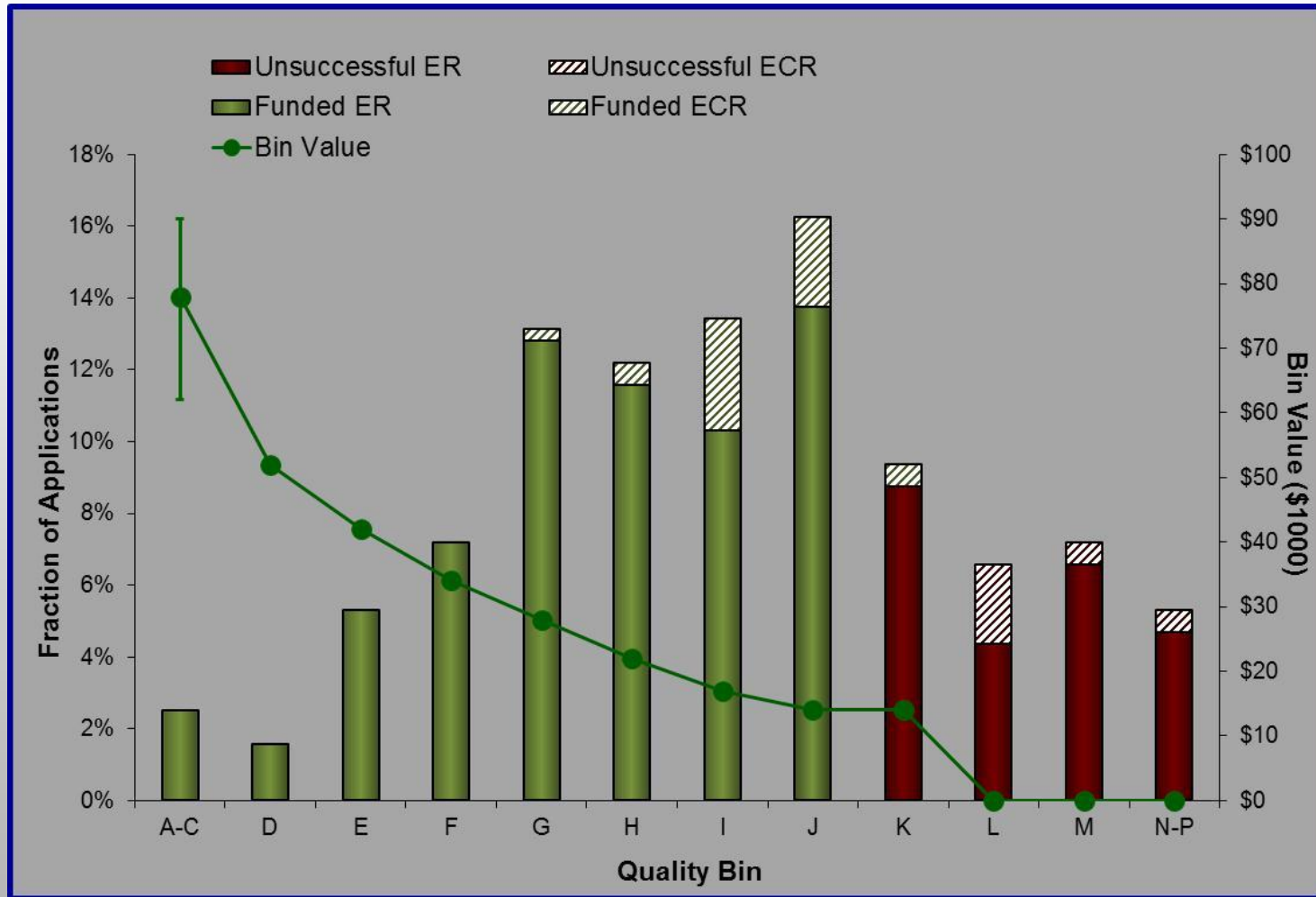
Results and Statistics – Computer Science

2012 Discovery Grants Competition



Results and Statistics – Computer Science

2012 Discovery Grants Competition



Results and Statistics – Computer Science

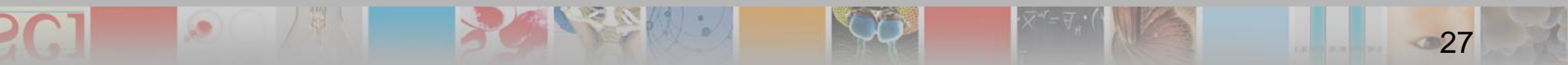
2012 Discovery Grants Competition

- Always a difficult task of balancing the amounts to be awarded (i.e., assigned to merit bins) in relation to the number of applicants funded.
- **For Computer Science:**
 - ER applicants supported down to merit category J. All applicants in category J were supported.
 - ECR applicants supported down to merit category K. All ECR applicants in category K were supported.

Results and Statistics

2012 Discovery Grants Competition

http://www.nserc-crsng.gc.ca/Professors-Professeurs/DiscoveryGrants-SubventionsDecouverte/Index_eng.asp



Discovery Accelerator Supplements

2012 Competition

- Provide substantial and timely additional resources to a small group of researchers to maximize the impact of *superior* discovery research programs that explore *high-risk transformational concepts*.
 - Transformational research: innovative approaches that can accelerate a research program in new directions and/or have great potential for major breakthroughs.
- Require researchers to have a *well-established* research program.
- *Timeliness* of DAS support relates to the potential for the researcher to capitalize on an opportunity (accelerate progress, maximize impact), such as a recent research breakthrough, a paradigm shift or a new strategy to tackle a scientific problem or research question.

Discovery Accelerator Supplements

2012 Competition

- \$120,000 - typically over three years.
 - Expand the recipient's research group (i.e., students, postdoctoral fellows, technicians);
 - Purchase, or to have access to, specialized equipment; or
 - Other initiatives/resources that would accelerate the progress of their research program.
- Up to 125 Supplements per year; majority will be in one of the four priority areas identified by the Federal Government: information and communications technologies; environmental science and technologies; manufacturing; and natural resources and energy.
- Each EG directly assesses and recommends its nominees, in agreement with a set quota.
- Quota of seventeen (17) supplements for Computer Science EG

Discovery Accelerator Supplements

2012 Competition

- During the Discovery Grants deliberations, applicants could be put forward as nominees by reviewers. In such cases, nominees were discussed and rated.
- After the competition, using the ratings, the nominees were ranked.
- The Executive Committee then reviewed the Discovery Grants review material (applications, contributions, external referee reports) of the DAS nominees.
- In a teleconference held on Feb. 29th, the Executive Committee reviewed and discussed the top half (ranking) of DAS nominees against the program's objective and criteria.
- A final merit-based ranked list was generated at the end of this review.

Research Tools & Instruments 2012 Competition

- Review carried out by an *ad hoc* review Committee

- Joel Martin (Chair)
National Research Council of Canada
- Michael Bauer
University of Western Ontario
- Raouf Boutaba
University of Waterloo
- Holger Hoos
University of British Columbia
- Ahmed Karmouch
University of Ottawa
- Kiriakos Kutulakos
University of Toronto
- Guy Lapalme
Université de Montréal
- Robert St. Amant
North Carolina State University
- Nadia Tawbi
Université Laval
- Melanie Tory
University of Victoria
- Kathikeyan Umapathy
University of North Florida
- Marcelo Wanderley
McGill University
- Calisto Zuzarte
IBM, Markham, Ontario

Evangelos Milios, *ex officio* (observer)

Research Tools & Instruments

2012 Competition

- One Lead reviewer and four Readers assigned to each application.
- Members submitted ratings in a forced flat distribution in advance of the deliberations.
- Scores were compiled; all applications that fell in the middle tier of the rankings, in addition to any flags (members; split votes), were discussed during the deliberations.
- Deliberations held via teleconference on January 23rd.
- Following deliberations, members could revise any of their individual scores, while a forced flat distribution had to be maintained by each member.

Research Tools & Instruments

2012 Competition Results

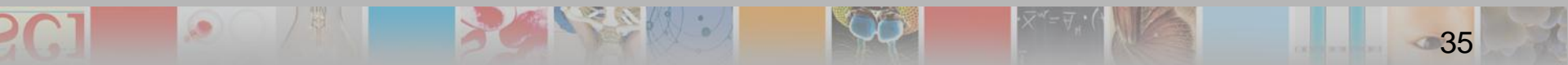
Research Tools & Instruments (Category 1)	EG 1507
Number of Applications	56
Number of Awards	14
Success Rate	25%
Funding Rate	20.5%
Total Budget (Awarded)	\$784,607

Reminder: The budget of the RTI program comes mostly from year-end funds

Other Information from NSERC

Budget 2012: The Highlights

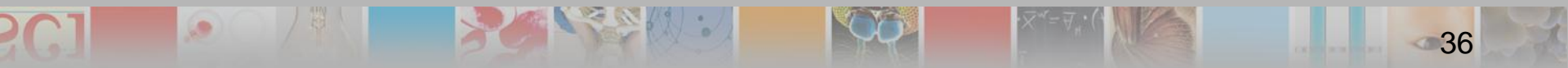
- Investment of \$15M per year for NSERC's Strategy for Partnerships and Innovation (p. 74 of the Budget, <http://www.budget.gc.ca/2012/plan/pdf/Plan2012-eng.pdf>).
- “programming in support of **basic research, student scholarships, and industry-related research initiatives and collaborations are preserved**. This approach sends a strong signal of the Government's commitment to these priority areas.” (p.268 of Budget)



Budget 2012 – Planned Reductions in Departmental Spending

- “The granting councils will be pursuing operational efficiencies and reallocation of funding from lower-priority programs to generate savings. **The Government will fully reinvest 2012–13 savings in priority areas of the granting councils, particularly in industry-academic partnerships.**” (p. 73)

Planned Savings—millions of dollars	2012-13	2013-14	2014-15	Ongoing
Natural Sciences and Engineering Research Council of Canada	15.0	30.0	30.0	30.0



Impact to Discovery Suite of Programs

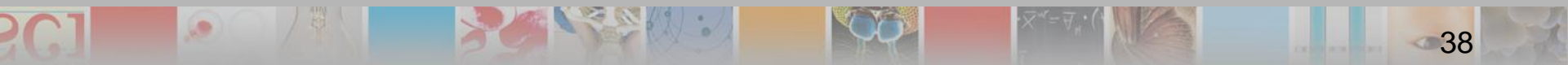
- **Major Resources Support Program**

- Program will no longer be accepting new applications at this time.
- Commitments for existing instalments will be honoured.
- Program is currently under moratorium.

Impact to Discovery Suite of Programs

■ Research Tools & Instruments

- There will be one final competition in 2013 at a reduced funding level as compared to previous competitions.
- Commitments for existing RTI grants will be honoured.
- The research community is encouraged to explore other avenues for funding research tools and instruments, including NSERC's many programs that allow for the purchase of equipment, among other expenses.
- Additionally, requests for smaller scale equipment can be incorporated into larger scale funding requests to the Canada Foundation for Innovation, where appropriate.



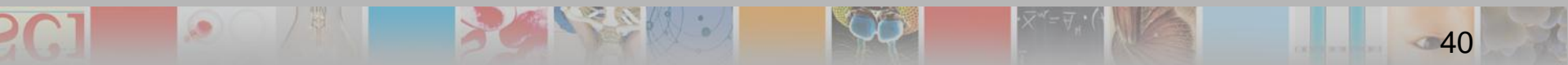
Changes in Application Process for Discovery Grants

- Notification of Intent to Apply for a Discovery Grant (Form 180) is now **mandatory** when applying for a Discovery Grant.
- Full applications that are submitted without first submitting a Form 180 will **not be considered**.
- Also, NSERC is **enforcing its deadlines**. Form 180 or full applications submitted **after the deadlines will not be considered**.
 - Form 180: August 1st.
 - Full DG application (Forms 101 & 100): November 1st.

Description of HQP Training in Discovery Grant Applications (Reminder)

- Since 2012 competition, **additional page*** added to the section “Proposal” of Form 101 – to be used to address the criterion “**Contributions to the training of Highly Qualified Personnel**”.
- Applicants are asked to describe their **plans** for the training of HQP in that page.
- Applicants are encouraged to carefully review the instructions on how to complete Form 101 before preparing their proposals.

* The number of additional pages is a function of the type of application – Individual (1), Team (2).



Budget Description in Discovery Grant Applications (Reminder)

- Since 2012 competition, a **maximum of two (2) pages** can be used for the **section “Budget Justification”** in which applicants provide the explanation and justification for the budget items identified in the “Proposed Expenditures” page.
- Applicants are encouraged to carefully review the instructions on how to complete Form 101 before preparing their proposals.

NSERC Discovery Frontiers

- To capitalize on emerging opportunities where Canada can benefit from its world-class capacity to take a leadership role in key areas of research and innovation.
- Suitable initiatives include:
 - high risk/high pay-off activities;
 - transformative/disruptive, paradigm-shifting research; new strategies to tackle an important problem of broad interest;
 - research that opens new fields or integrates existing fields in new ways;
 - research that accelerates the establishment of expertise and capacity that is in demand; and
 - research that provides solutions and breaks down barriers at the forefront of significant scientific problems and research questions.

NSERC Discovery Frontiers

- Key points to keep in mind about supported projects:
 - They must include international collaboration that taps into global expertise.
 - They should encourage collaboration and integration across several disciplines within the natural sciences and engineering (NSE).
- Discovery Frontiers' first call for proposals (2010): Northern Earth System Research - \$4 million over a four-year period.
- Theme for next call for proposals will be determined in summer 2012.
- Dr. Milios, Group Chair, will present to COGS a proposal for the next theme, on behalf of NSERC CS Liaison Committee:
Tapping the Digital Data Goldmine.

Communication Tools for the Discovery Grants Program (Reminder)

- Since 2011, new ways to communicate program information and details about the peer review process to prospective applicants
- Two [videos](#) are available in the [Professors](#) section of NSERC's Web site.
 - Tips on applying for an NSERC Discovery Grant.
 - Demystifying the review process for NSERC Discovery Grants.

