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Natural Sciences and Engineering  
Research Council of Canada

Conseil de recherches en sciences  
naturelles et en génie du Canada

Canada

# 2015 Research Grants Competition

## Subatomic Physics Evaluation Section

### Report from the Section Chair to the Community

**Presented by: John Martin, University of Toronto**  
**On Behalf of: Stefan Westerhoff, University of Wisconsin- Madison**

Congress of the Canadian Association of Physicists  
June 15, 2015 – Edmonton, AB



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# Outline

- Subatomic Physics Evaluation Section (SAPES)
- Pre-competition Activities
- Large Project Day and Competition Week
- Rounds 1 2, and 3
- Competition Financial Report
- Evolution of Awards
- Discovery Accelerator Supplements
- Policy Matters
- Information for the 2016 Competition

# Subatomic Physics Evaluation Section

## 2015 Competition

Name	Institution	Term	Expertise
Yorick Blumenfeld	Institut de physique nucléaire d'Orsay	2013-2016	Experimental NP
Andrzej Czarnecki	University of Alberta	2012-2015	Theoretical HEP
Eckhard Elsen	DESY & Universität Hamburg	2014-2017	Experimental HEP
Morten Hjorth-Jensen	University of Oslo & Michigan State University	2012-2015	Theoretical NP
Augusto Macchiavelli	Lawrence Berkeley National Laboratory	2013-2016	Experimental NP
Naomi Makins	University of Illinois at Urbana-Champaign	2014-2017	Experimental IEP
Mark Messier	Indiana University	2013-2016	Experimental HEP
Adam Ritz	University of Victoria	2014-2017	Theoretical HEP, Strings
Neil Spooner	University of Sheffield	2013-2016	Experimental HEP
Julia Thom-Levy	Cornell University	2013-2016	Experimental HEP
Stefan Westerhoff ( <i>Chair</i> )	University of Wisconsin - Madison	2012-2015	Experimental HEP, Astro.

- 11 instead of the usual 12 members (Klaus Jungmann unable to join this year)
- Mark Messier had to leave after 1st day of competition week

# The Subatomic Physics Evaluation Section

## Support to Operations

- Group Chair
  - Li-Hong Xu; University of New Brunswick
  - Monitors consistency of deliberations, provides advice on procedures and policies
  - **Not** a member; does **not** participate in reviews/votes
- *Ad hoc* Peer Review Process Advisor
  - **New** position for 2015, since no CDN experimentalists on SAPES
  - John Martin; University of Toronto
  - Advice on Canadian SAP context during deliberations
  - Read all proposals, but **not** a reviewing/voting member
    - except on a few proposals, because of departure of Mark Messier
- NSERC Staff
  - Shashini Jayaratne; Program Assistant
  - Jamie Cousineau / James Murphy; Program Officers
  - Sarah Overington; Team Leader

**Many thanks  
from SAPES!!**

# The Subatomic Physics Evaluation Section

- Funded through an **independent envelope, with its suite of programs -- unique mechanism at NSERC**
- Evaluates applications to various Subatomic Physics programs
  - Individual, Team, and Project Discovery Grants
  - Research Tools and Instruments (RTI; categories 1, 2, 3) Grants
  - Major Resources Support (MRS) Grants
- This comprehensive approach is essential
  - Complexity and inter-dependency of many proposals
  - Country-wide collaborations among individuals, groups, universities, and national research organizations
  - Long-term and large-scale international projects and commitments
  - Possibility to exchange funds between the various programs as a function of the priorities of the community and the pressures it faces



# Pre-Competition Activities

- By **August 1<sup>st</sup>**, applicants submit:
  - **Notification of Intent to Apply (NOI)** for a Subatomic Physics **Discovery Grant** through the Research Portal to assist in the selection of external referees, confirm the assignment of the application to the Subatomic Physics Evaluation Section, and assess the need for expertise from other Physics Sections (or even other Evaluation Groups)
  - **Notification of Intent to Apply (NOI)** for a **Major Resources Support** Grant to assist in determining the review mechanism
- Members provide their comfort level to review each application
- Section Chair selects members to be 1<sup>st</sup> or 2<sup>nd</sup> (or 3<sup>rd</sup> where appropriate) internal reviewers
- **First internal reviewer selects external reviewers** (Discovery)
  - Mix from applicant's list and others
  - No conflicts of interest
  - No applicants or co-applicants applying in current year

# Pre-Competition Activities

- Applicants submit applications to NSERC
  - **October 1:** RTI applications for equipment over \$150k (categories 2 and 3), MRS applications, and Project Discovery applications requesting more than an average of \$500k per year
  - **October 25:** RTI applications for equipment up to \$150k (category 1)
  - **November 1:** Individual, Team, and Project Discovery applications requesting less than an average of \$500k per year
- NSERC and SAPES Chair identify proposals for site visits
  - One- to two-day review by an international committee of experts
  - Could include Section members (except 1<sup>st</sup> internal reviewers)
  - Section Chair (or substitute) as *observer*
  - Report, including funding recommendations, is made available to SAP Section before competition week (except those in conflict)



# Pre-Competition Activities

- SAPES orientation and policy meeting
  - November 6, 2014 via teleconference
  - Presentation and discussion of operating and review procedures
  - Review of preliminary competition budget
  - Q&A period with CINP and IPP directors regarding jointly prepared document on context of Canadian research environment

# Pre-Competition Activities

- Mid-December: All applications are sent to SAPES members
  - members read all applications, except:
    - Those for which they are in conflict
    - Theory, RTI-1 and MRS typically < \$500k/yr only need to be read by members of the respective sub-Sections
  - members *must not discuss* the applications with other members or the applicants
  - 1st and 2nd reviewers carry out an in-depth assessment of the applications assigned to them

# Pre-Competition Activities

- Fall assessment of NOI's by the Physics Section Chairs
  - Review applications crossing the boundaries of two or more Sections within the Physics Evaluation Group (EG) or related to a discipline other than physics
  - Identify Section that should take the lead for the review and determine need to provide/receive expert input to/from other Physics Sections or EG
  - Outcome
    - **Two** applications submitted to the Physics EG were transferred to SAPES
    - For **four** applications, SAPES received expert input from members of the Physics EG with relevant expertise
    - Members of SAPES participated in the review of **three** Individual Discovery grant applications in other Sections of the Physics EG and in the Mechanical Engineering EG
    - **One** member of SAPES also provided recommendations for external reviewers on one application in another Section of the Physics EG

# Pre-Competition Activities

- Reviews by *ad hoc* or standing Committees
  - ATLAS-Canada (Dec. 11-12, Vancouver)
  - Belle-II project
    - Via teleconferences (Jan. 7 and 16)
  - DEAP-3600 project
    - Via teleconferences (Nov. 25 and Jan. 14)
  - SNO+ (Dec. 6-7, Kingston)

# Large Project Day

- March 8, 2015 in Ottawa
- Typically requests > \$500k/yr or category 2-3 RTI. Invited applicants receive *ad hoc* review reports in advance (w/o funding recommendations)
  - All participants receive SAPES questions in advance
  - This year's LPD invitees, in order of presentation:
    - Precision measurements with the **TITAN** ion trap system at ISAC
    - The **Belle II** Project and The Belle II Calorimeter R&D
    - The **ATLAS** Experiment at the CERN LHC
    - Fundamental **SRF** Research into Niobium and New Materials
    - **IceCube** data analysis and detector upgrade developments
    - **SNO+** Completion, Commissioning, Operations and Early Data
    - **SuperCDMS** SNOLAB construction
- *In camera* with management
  - **CINP; IPP; Perimeter Institute; SNOLAB; TRIUMF**

# Competition Week

- Competition week: **March 9 - 13, 2015** in Ottawa
- Assessment of applications done in 3 rounds
  - Round 1: without regard to budget pressure
  - Round 2: reconsider funding recommendations to fit into available budget following consistent and fair re-assessment of *all* the applications
  - Round 3: further adjustment of budget, if necessary
- Deliberations strictly followed NSERC's policies and guidelines throughout all rounds of competition
- NSERC's President Mario Pinto, VP Pierre Charest, and Director Elizabeth Boston were present for some deliberations



# Competition Details

- 58 applications
- Total requested: \$17.780M
- Available funds: \$11.431M
- Projected average funding rate was 64%

Compare to:

2007	2008	2009	2010	2011	2012	2013	2014	2015
55%	66%	66%	57%	61%	69%	53%	52%	64%

# Competition Budget

## 2015 Competition - Subatomic Physics Envelope Budget

### BEGINNING OF COMPETITION

(millions of dollars)

Budget Item	2014-15	2015-16	2016-17	2017-18	2018-19
<b>Base Budget<sup>1</sup></b>	21.188	21.188	21.188	21.188	21.188
<b>Cumulative <u>Permanent</u> Transfers:</b>					
New Applicants / Early Career Researchers <sup>2</sup>	1.747	1.747	1.747	1.747	1.747
Transfers due to population dynamics <sup>3</sup>	-0.265	-0.265	-0.265	-0.265	-0.265
Budget 2014 addition of funds <sup>4</sup>		0.474	0.632	0.790	0.790
<b>Temporary Transfers:</b>					
Forward-Borrow	0.000	0.000	0.000	0.000	0.000
<b>Total Fiscal Year</b>	22.670	23.121	23.302	23.460	23.460
<b>Actual Spending by End of Yearly Competition</b>	22.680				
<b>Carry-forward<sup>5</sup></b>	-0.023				
<b>Commitments</b>		-11.690	-5.918	-1.236	-0.636
<b>Available for competition</b>		11.431			

# Competition Budget

## Table's Footnotes

<sup>1</sup> Includes any past (re-)allocations and transfers from other programs.

<sup>2</sup> Following Budget 2011, a supplement of \$5,000 was provided towards the support of each Early Career Researcher (active grant) starting from FY2011. The cumulative increase to the envelope has been of \$125k (up to 2013-14).

<sup>3</sup> Net total of grants held by returning applicants whose new applications are transferred in/out from SAP Evaluation Section and other adjustments based on applicants leaving/entering the Section.

<sup>4</sup> Following Budget 2014, new funds are being phased into the envelope over a three-year period, beginning in FY2015.

<sup>5</sup> For each year, the carry forward is calculated by subtracting the actual spending from the total fiscal year allotment, then adding the previous year's carry-forward amount.

# Round 1

- Members in conflict of interest leave the room
- **Presentation by the first internal reviewer**
  - Overview of physics and review of all aspects of proposed activities
  - Summary of *external* reviews and *ad hoc* reports (if applicable)
  - Assessment of each selection criterion and recommendations on funding and duration
- Additional **comments by the second internal reviewer** (independent assessment; reviewers do not know other's identity)
  - Assessment of each selection criterion and recommendations on funding and duration
- Discussion by the entire Section (or sub-Section)
- Secret electronic voting
  - Selection criteria (1:exceptional to 6:insufficient)
  - “Fund” or “No fund”
  - Level and duration of funding
  - Median vote is taken as the final recommendation
- Any member could “flag” an application if he/she felt that some aspect of the discussion was not adequately resolved
- Members were not allowed to tally results to avoid biases

## **Selection Criteria:**

- Researcher(s) Excellence
- Merit of Proposal
- HQP
- Need (urgency) for funds

# Round 1

- Full Section deliberations
  - Experimental Individual, Team, Project
  - Major RTI (categories 2 & 3)
  - Major MRS (> \$500k/yr)
- Sub-Sections (in parallel)
  - Theory applications
  - Smaller RTI (category 1) and MRS
- Conclusion of Round 1
  - Re-discussed flagged applications
  - NSERC personnel tallied the budget

## Very approximate time allocation

- RTI-1 & Individual 15 minutes
- RTI-3 30 minutes
- MRS & Project 20 minutes
- Larger Project 30-45 minutes

# End of Round 1

- Available Funds: \$11.431M
- Requested: \$17.780M
- Recommended in Round 1: \$13.133M
- Balance: - \$1.702M
- For Round 2
  - Same set of principles applied to all proposals
  - All proposals again assessed strictly on their merits
  - Strict account taken of the evaluations of the four criteria for each proposal (recorded in Round 1)
  - NSERC personnel again tallied the budget



# End of Round 2

- Available Funds: \$11.478M\*
- Requested: \$17.780M
- Recommended in Round 2: \$11.496M
- Balance: - \$18k
- SAPES members unanimously agreed to forward-borrow the \$18k from the 2016 competition

\*During the competition, \$47k in additional funds was secured for the SAP envelope, bringing the sum of available funds to \$11.478M

# Budget at End of Competition

## 2015 Competition - Subatomic Physics Envelope Budget

**END OF COMPETITION**

*(millions of dollars)*

Budget Item	2015-16	2016-17	2017-18	2018-19	2019-20
<b>Base Budget<sup>1</sup></b>	21.188	21.188	21.188	21.188	21.188
<b>Cumulative <u>Permanent</u> Transfers:</b>					
New Applicants / Early Career Researchers <sup>2</sup>	1.747	1.747	1.747	1.747	1.747
Transfers due to population dynamics <sup>3</sup>	-0.218	-0.215	-0.215	-0.215	-0.215
Budget 2014 addition of funds <sup>4</sup>	0.474	0.632	0.790	0.790	0.790
<b>Temporary Transfers:</b>					
Forward-Borrow	0.000	0.000	0.000	0.000	0.000
<b>Total Fiscal Year</b>	23.168	23.352	23.510	23.510	23.510
<b>Actual Spending by End of Yearly Competition</b>	23.186				
<b>Carry-forward<sup>5</sup></b>	-0.018				
<b>Commitments</b>		-16.000	-10.500	-1.782	-1.142

See slide 17 for footnotes

# Multiyear Commitments at End of Competition

	2015	2016	2017	2018	2019
RTI - COMMITTED	\$21,000	\$0	\$0	\$0	\$0
RTI - NEW (2015 Competition)	\$264,285	\$85,000	\$35,000	\$0	\$0
<b>RTI - TOTAL</b>	<b>\$285,285</b>	<b>\$85,000</b>	<b>\$35,000</b>	<b>\$0</b>	<b>\$0</b>
THEORY - COMMITTED	\$2,344,700	\$1,616,700	\$1,080,200	\$526,000	\$0
THEORY - NEW (2015 Competition)	\$1,116,100	\$1,088,100	\$1,078,100	\$949,100	\$949,100
<b>THEORY - TOTAL</b>	<b>\$3,460,800</b>	<b>\$2,704,800</b>	<b>\$2,158,300</b>	<b>\$526,000</b>	<b>\$0</b>
EXP OPS** - COMMITTED	\$7,402,000	\$4,181,000	\$156,000	\$110,000	\$0
EXP OPS - NEW (2015 Competition)	\$9,648,470	\$8,436,370	\$7,671,420	\$151,370	\$144,957
<b>EXP OPS - TOTAL</b>	<b>\$17,050,470</b>	<b>\$12,617,370</b>	<b>\$156,000</b>	<b>\$110,000</b>	<b>\$0</b>
MRS - COMMITTED	\$1,922,000	\$120,000	\$0	\$0	\$0
MRS - NEW (2015 Competition)	\$467,444	\$476,207	\$484,173	\$46,000	\$48,000
<b>MRS - TOTAL</b>	<b>\$2,389,444</b>	<b>\$596,207</b>	<b>\$484,173</b>	<b>\$46,000</b>	<b>\$48,000</b>
<b>TOTAL - COMMITTED</b>	<b>\$11,689,700</b>	<b>\$5,917,700</b>	<b>\$1,236,200</b>	<b>\$636,000</b>	<b>\$0</b>
<b>TOTAL - NEW (2015 Competition)</b>	<b>\$11,496,299</b>	<b>\$10,085,677</b>	<b>\$9,268,693</b>	<b>\$1,146,470</b>	<b>\$1,142,057</b>
<b>GRAND TOTAL</b>	<b>\$23,185,999</b>	<b>\$16,003,377</b>	<b>\$10,504,893</b>	<b>\$1,782,470</b>	<b>\$1,142,057</b>
<b>TOTAL ENVELOPE</b>	<b>\$23,190,811</b>	<b>\$23,351,331</b>	<b>\$23,509,251</b>	<b>\$23,509,251</b>	<b>\$23,509,251</b>
<b>REIMBURSEMENT - FORWARD BORROW FROM PAST COMPETITIONS</b>	<b>-\$22,931</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>
<b>FORWARD BORROW FROM FY2016 / AVAILABLE</b>	<b>-\$18,119</b>	<b>\$7,329,835</b>	<b>\$13,004,358</b>	<b>\$21,726,781</b>	<b>\$22,367,194</b>

\*\*EXP OPS = Experimental Operations – Includes Project grants and experimental Individual grants

# Share of Envelope at End of Competition

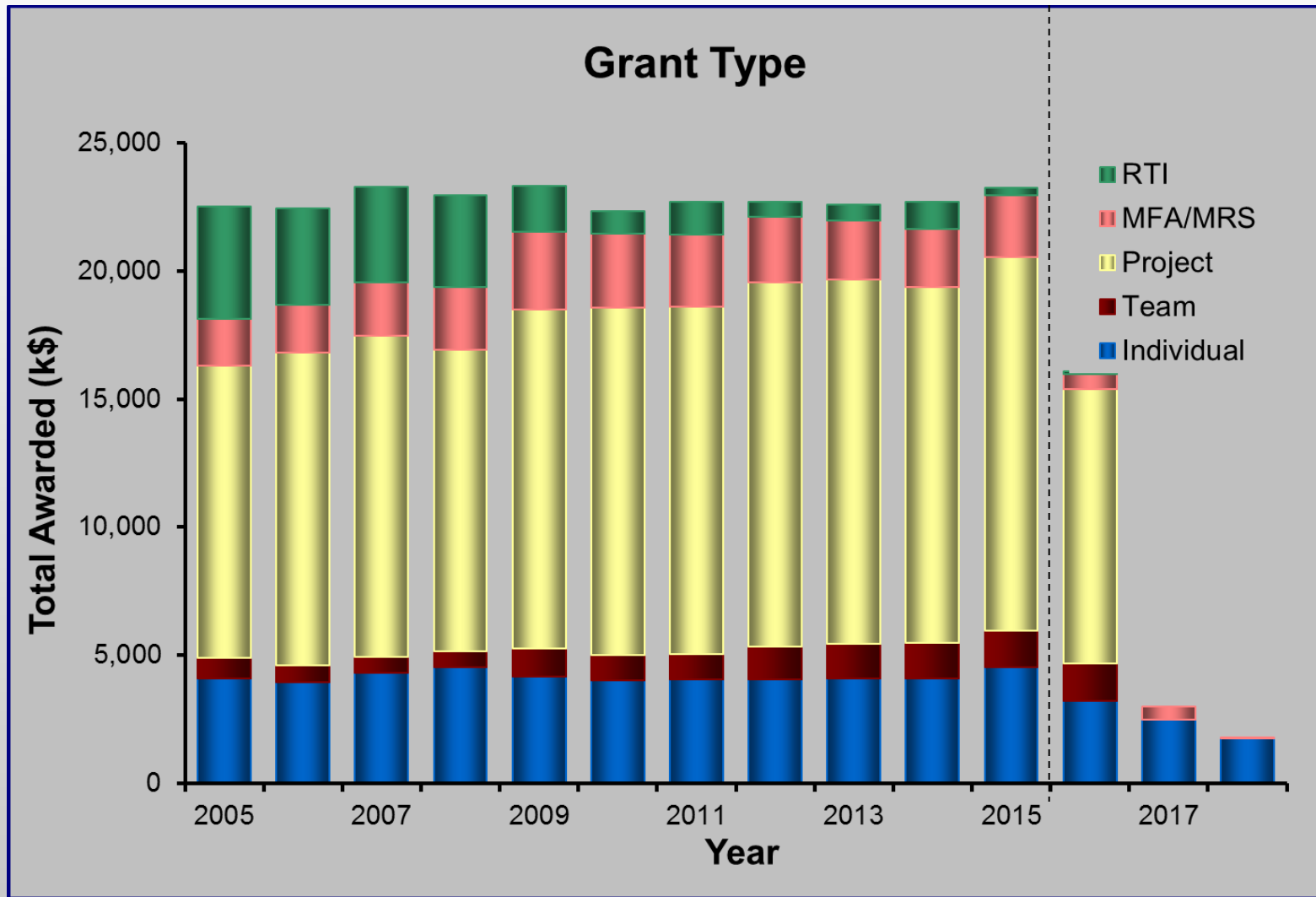
## Comparison to Past Years

### Subatomic Physics Evaluation Section Evolution of Envelope's Shares

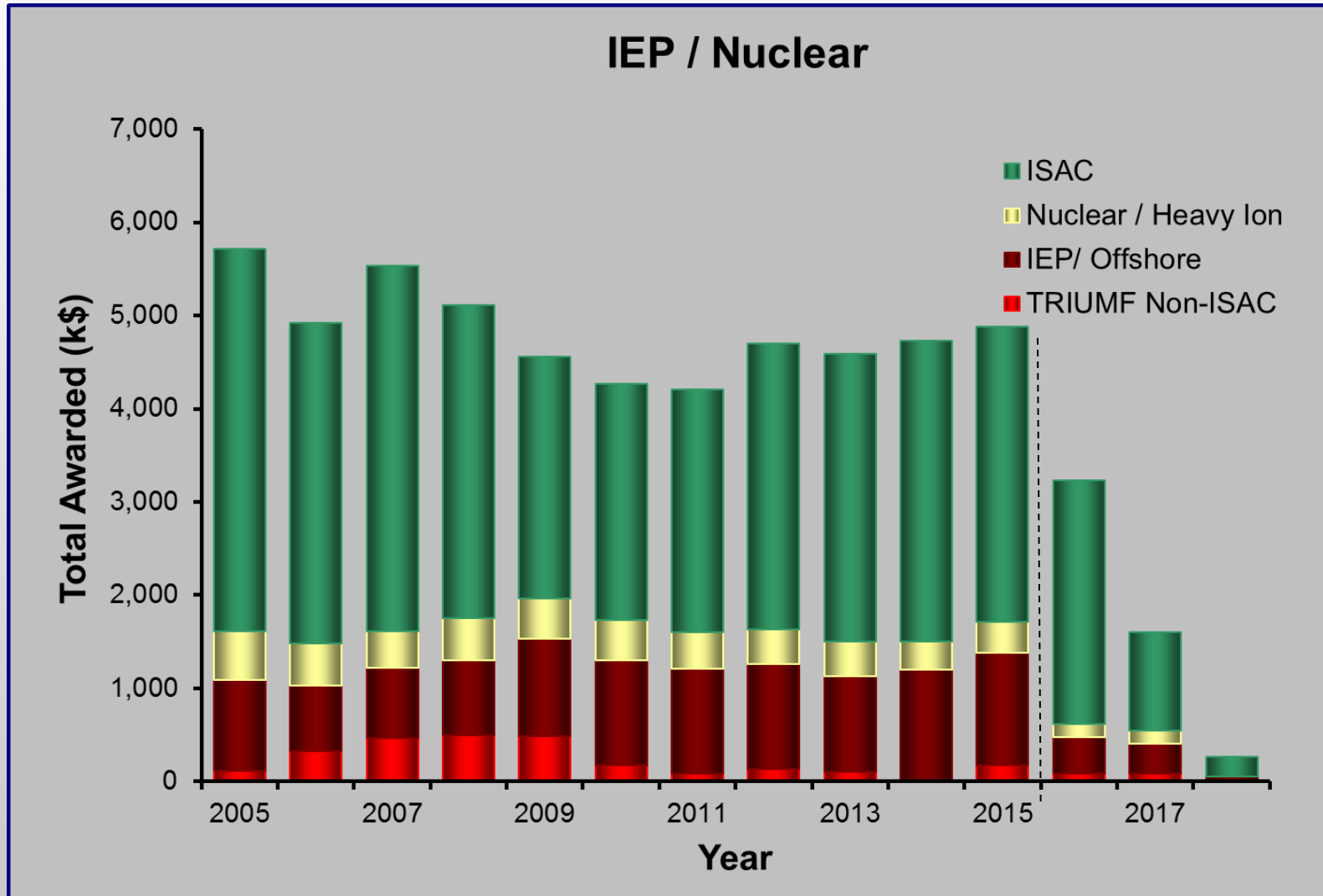
	2015	2014	2013	2012	2011	2010	2009	2009	2008	2007*
<b>Theory</b>	15%	14%	14%	14%	14%	14%	14%	14%	15%	16%
<b>RTI</b>	1%	5%	3%	3%	6%	4%	8%	8%	16%	14%
<b>Total Research Ops</b>	84%	81%	83%	83%	80%	82%	82%	82%	69%	70%
<b>Exp. Ops</b>	74%	71%	73%	72%	68%	69%	69%	69%	59%	61%
<b>MRS</b>	10%	10%	10%	11%	13%	13%	13%	13%	11%	10%

\* Takes into account the fact that SNOLAB's MRS grant was subsequently paid from outside the envelope.

# Evolution of SAPES Awards

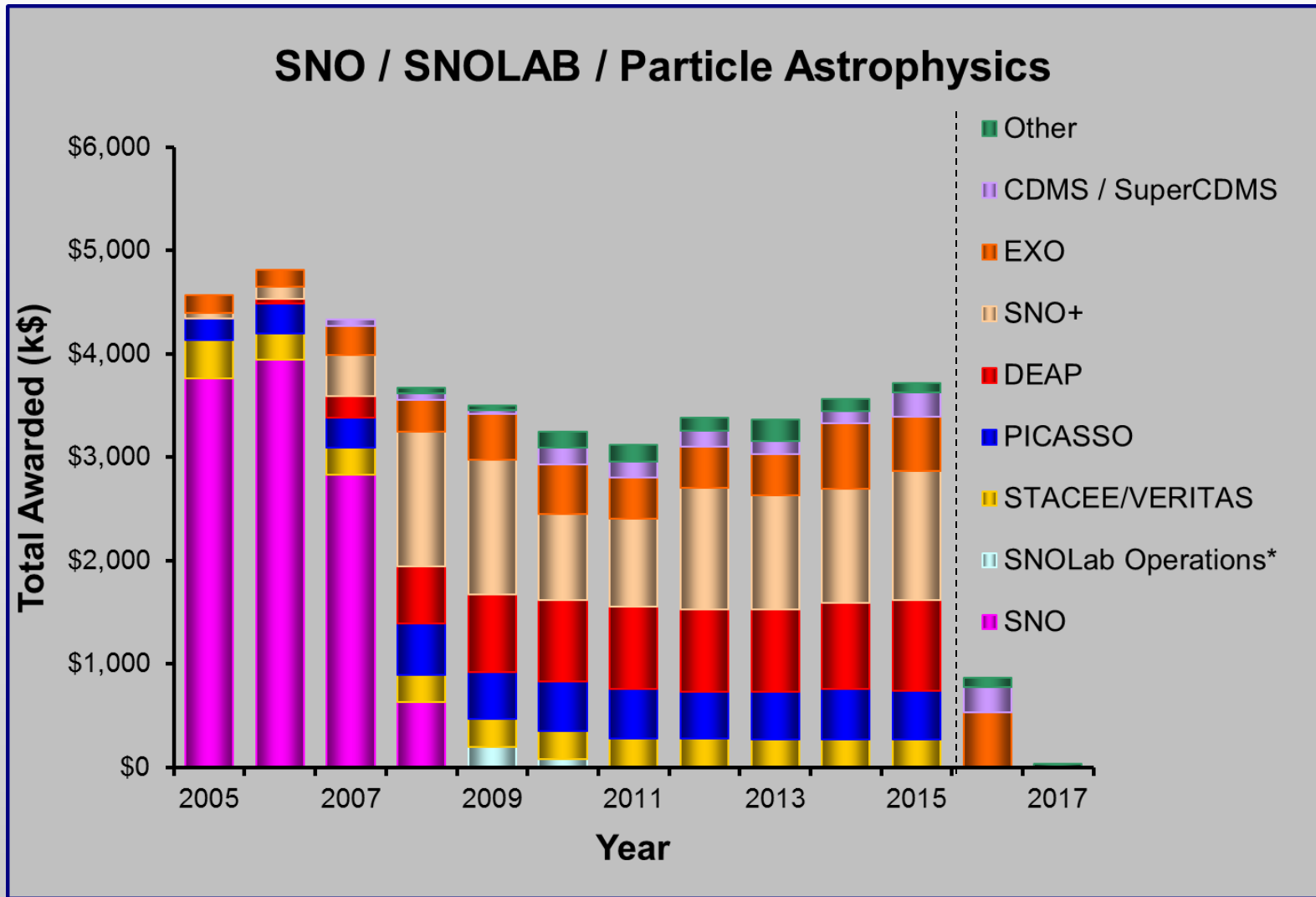


# Evolution of SAPES Awards

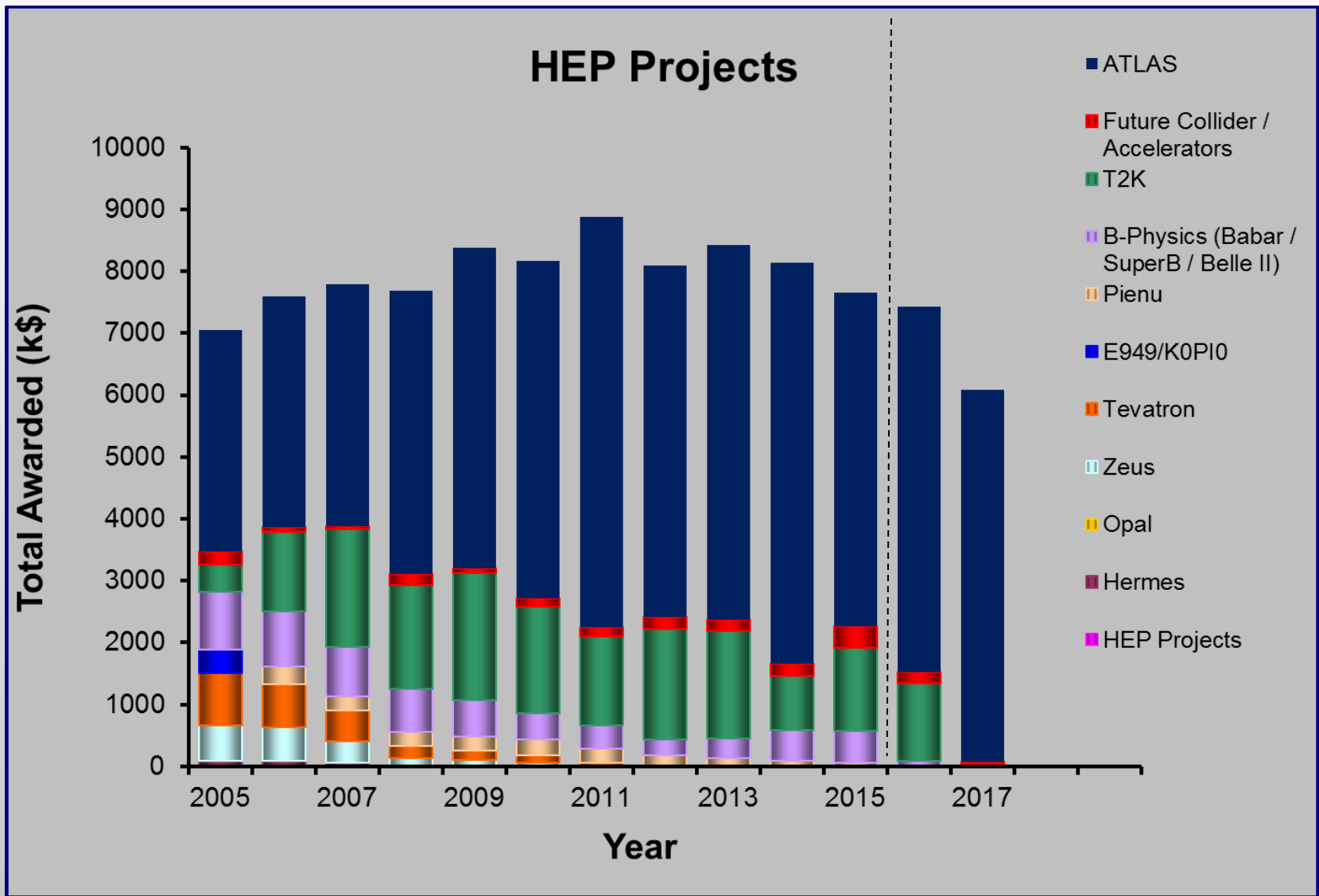




# Evolution of SAPES Awards

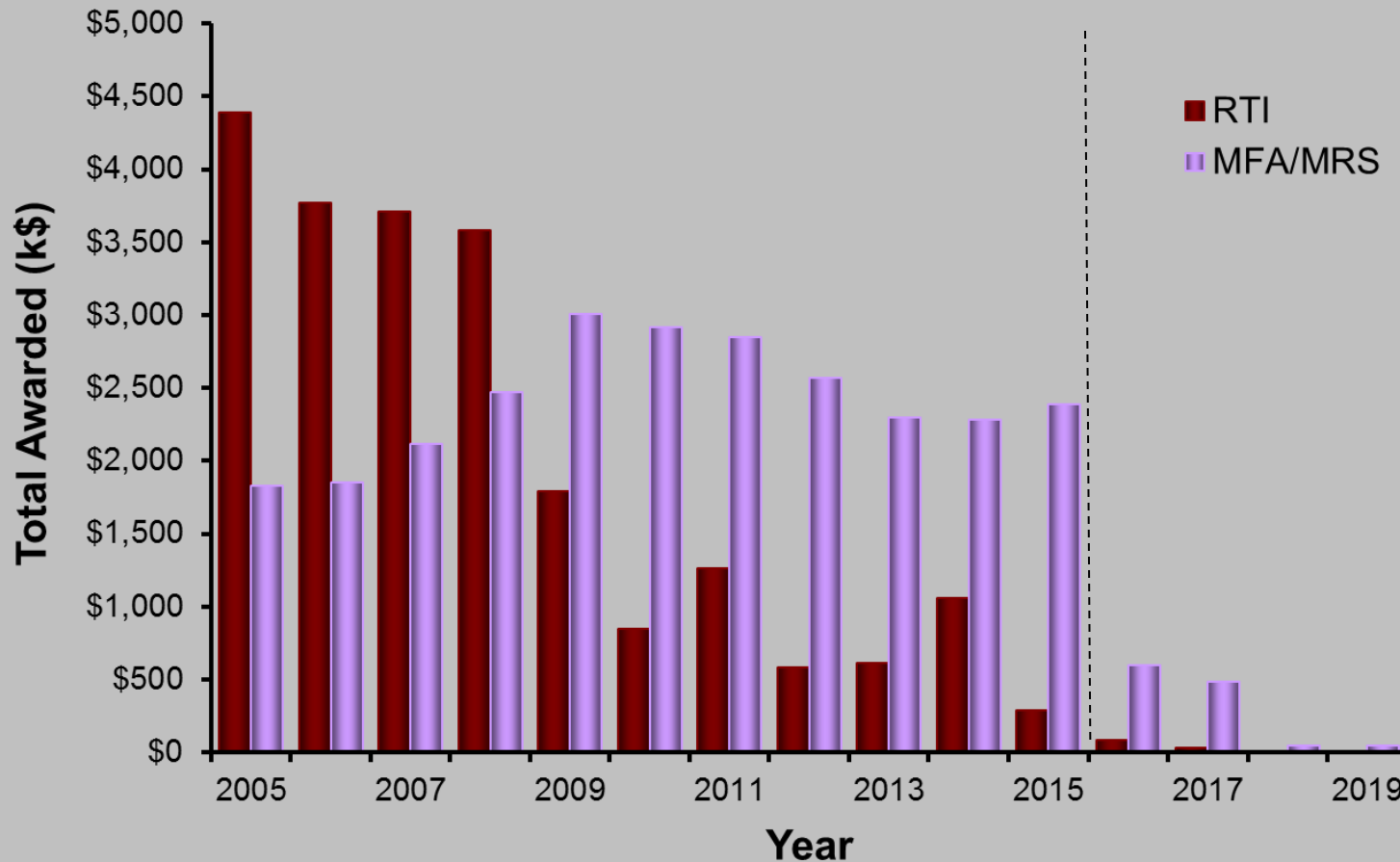


# Evolution of SAPES Awards

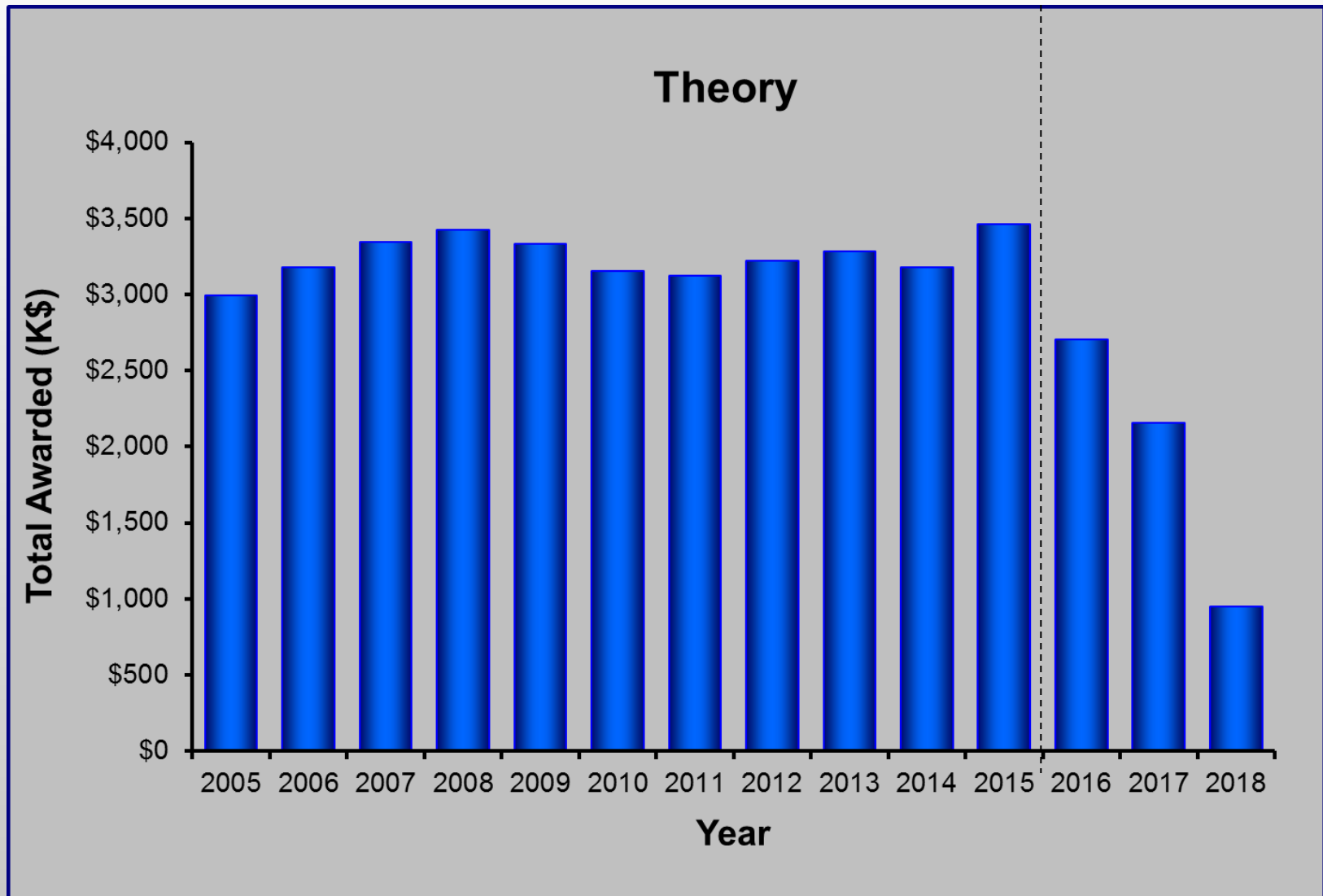


# Evolution of SAPES Awards

## Infrastructure Operation Support and Equipment



# Evolution of SAPES Awards



# Round 2 – Discovery Accelerator Supplements

- Provides substantial and timely resources to researchers who have a superior research program that is **highly rated in terms of originality and innovation**, and who show strong **potential to become international leaders** within their field
- These additional resources should enable a researcher with an **established research program** to **capitalize on an opportunity**, such as a recent research breakthrough, a paradigm shift, or a new strategy to tackle a scientific problem or research question
- Section directly recommends candidates, in agreement with a set quota
- Quota of one (1) for the SAPES in 2015

# Policy Matters

- Elizabeth Boston (Director), Rawni Sharp (from Secretariat), Pierre Charest (VP) participated in the meeting
  - The Section is thankful to NSERC's senior management for ensuring that open and frank communications are ongoing with the Section
- The Section highly values the role of the Expert Review Committees and recommends that NSERC increase the number of face-to-face Site Visits (as opposed to teleconferences) within their budgetary constraints
- Large portion of meeting was dedicated to discussing Conflict of Interest (Col) guidelines. *See next slides*



# Canadian representation on SAPHES

- NSERC recognizes the importance of Canadian representation on the Evaluation Section, as emphasized by SAPHES members and the broader research community
- Several barriers exist, including **Conflict of Interest guidelines**
- Feedback was received from SAPHES, IPP, CINP on the current guidelines:
  - General sense that these are too strict in the definition of what constitutes *collaboration*
  - For large projects, the actual relationship between reviewer and participant should be assessed to determine if a real or perceived conflict exists. E.g.:
    - co-applicants on an MRS grant do not necessarily interact directly or collaborate on research;
    - some large grants have very separate sub-projects
  - In these situations, there should be some flexibility to examine conflict on a case-by-case basis

# Canadian representation on SAPES

- Proposed solutions to be adopted in 2015-16:
  - Canadian members will be invited to serve on the committee with the option of stepping down for a year when they are PI on an application
  - In the case of very large projects and collaborations, NSERC will examine each case, with the Chair or another member of the Section, to determine if a real or perceived conflict exists.
    - If an exception is made to current guidelines, the conflict will be disclosed to all members at the beginning of deliberations.
- Your input?

# Passing the baton to ...



Adam Ritz

**University of Victoria**



Yorick Blumenfeld

**Institut de physique  
nucléaire d'Orsay**

Co-Chairs of the SAPES for 2015-16

# Round 3 – Discovery Accelerator Supplements

- During the *first* round of deliberations, for each Individual and Team Discovery Grants application, SAPES members could put forward the applicant(s) after the deliberation and votes
- During Round 2 (once budget balancing was completed), all the potential candidates were discussed in detail against the DAS selection criteria and objective
- Subsequently, the members rated each candidate on a scale of 1 (Very Well) to 4 (No Support) by secret vote, and one candidate was selected by numerical tally of the Section's votes
- Guidelines on conflicts of interest strictly applied
- DAS program not aimed at Project grant applications
- Procedure is available for any member of a Collaboration submitting a Project grant application to be considered by SAPES for the DAS program