



Conseil de recherches en sciences  
naturelles et en génie du Canada

Canada

# 2018 Competition

## Report from the SAPES Co-Chair to the Community

**Presented by: Jeffery Martin, University of Winnipeg**

**Congress of the Canadian Association of Physicists  
June 11-15, 2018 – Halifax, NS**



Natural Sciences and Engineering  
Research Council of Canada

Conseil de recherches en sciences  
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# Outline

- Subatomic Physics Evaluation Section (SAPES)
- Pre-competition Activities
- Large Project Day and Competition Week
- Rounds 1 and 2
- Competition Financial Report
- Evolution of Awards
- Discovery Accelerator Supplements
- Policy Matters
- Information for the 2019 Competition



# Subatomic Physics Evaluation Section

## 2018 Competition

| Name                     | Institution   | Term      | Expertise                              |
|--------------------------|---|-----------|--|
| Angela Bracco            | University of Milano  | 2017-2020 | Experimental NP                        |
| Alex Buchel              | The University of Western Ontario                                   | 2017-2020 | Theoretical HEP                        |
| Alfredo Galindo-Uribarri | Oak Ridge National Laboratory & University of Tennessee - Knoxville | 2016-2019 | Experimental NP                        |
| Hans Kraus               | University of Oxford  | 2016-2019 | Experimental HEP, Astro.               |
| Heather Logan            | Carleton University   | 2015-2018 | Theoretical HEP                        |
| Jeffery Martin           | University of Winnipeg  | 2016-2019 | Experimental IEP, Fundament Symmetries |
| Gabriel Martinez Pinedo  | Technische Universität Darmstadt                                    | 2015-2018 | Theoretical NP                         |
| Tor Raubenheimer         | Stanford Linear Accelerator Center / Stanford University            | 2016-2019 | Experimental HEP                       |
| Niki Saoulidou           | University of Athens  | 2016-2019 | Experimental HEP                       |
| Brigitte Vachon          | McGill University   | 2016-2019 | Experimental HEP                       |
| Magnus Wolke             | Uppsala University  | 2017-2020 | Experimental NP                        |

Alfredo Galindo-Uribarri participated remotely.



# The Subatomic Physics Evaluation Section

## Support to Operations

- Group Chair
  - Kari Dalnoki-Veress, McMaster University
  - Monitors consistency of deliberations for Physics in general; provides advice on procedures and policies as needed
  - Not a member; does not participate in reviews/votes; did not attend SAP Competition week in 2018.
  
- NSERC Staff
  - Shashini Jayaratne & Campbell Whillans, Program Assistants
  - Kim Bonnet & Caroline Bicker, Program Officers
  - Emily Diepenveen, Team Leader
  - Elizabeth Boston, Director

**Many thanks  
from SAPHES!!**

# 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 and Project Discovery Grants
  - Research Tools and Instruments (RTI - Category 1, 2 or 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 (Project or Individual) Discovery Grant through the Research Portal
  - Notification of Intent to Apply (NOI) for a SAP Major Resources Support Grant through the Research Portal
  - Notification of Intent to Apply (NOI) for a SAP Research Tools and Instruments - Cat. 2/3 Grant through the Research Portal
- NSERC and SAPES Co-Chairs identify proposals for Expert Reviews
- By **late September**:
  - Members provide their comfort level to review each application
  - NSERC and Co-Chairs select members to be 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> (where required) internal reviewers



# Pre-Competition Activities

- Applicants submit full applications to NSERC:
  - October 1:** RTI applications for equipment over \$150k (Cat 2 & 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 (Cat 1)
  - November 1:** Individual and Project Discovery applications requesting less than an average of \$500k per year
- **October 24:** SAPES 2018 Orientation & Policy meeting – held by teleconference
- Fall assessment of NOI's crossing the boundaries within Physics, and other Evaluation Groups
- **Mid-December:** All applications are sent to SAPES members

# Pre-Competition Activities

- Reviews by *ad hoc* or standing Committees
  - ATLAS-Canada                      Nov. 10-11, Toronto
  - TITAN                                  Nov. 17-18, Vancouver

# Large Project Day

LPD 2018 was held January 29, 2018 in Ottawa:

- Participants receive SAPES questions in advance
- This year's LPD invited participants were (by collaboration in alpha order):
  - ATLAS
  - DEAP-3600
  - TITAN
  - \*SNO+
- *In camera* meetings with institutional representatives:  
**CFI, CINP, CPARC, IPP, Perimeter, SNOLAB, and TRIUMF.**

\* Written responses to SAPES questions provided in advance of LPD.



# Competition Week

- Competition week: **January 30 – February 2, 2018** in Ottawa
- Assessment of applications done in 2 rounds
  - Round 1: determine Merit Criteria ratings & recommend efficient budget for supported research activities
  - Round 2: reconsider funding recommendations to fit into available budget following consistent and fair re-assessment of *all* the applications

Deliberations followed NSERC's policies and guidelines throughout all rounds of competition.

NSERC's VP Pierre Charest, and Director Elizabeth Boston were present for some deliberations.

# Competition Details

- 39 applications
- Total requested: \$12.977M
- Available funds: \$9.625M
- Projected average funding rate was 74%

Compare to:

| 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016  | 2017 |
|------|------|------|------|------|------|------|-------|------|
| 66%  | *57% | 61%  | 69%  | 53%  | 52%  | 64%  | **55% | 74%  |

\* Without SNOLAB operations

\*\* Includes increase from *Budget 2016*

# Competition Budget

**SUBATOMIC PHYSICS ENVELOPE**  
**MULTI-YEAR COMMITMENTS BY CATEGORY**  
**Start of 2018 Comp**

|  | 2018                | 2019                | 2020                | 2021                |
|--|---------------------|---------------------|---------------------|---------------------|
| RTI - COMMITTED  | \$0                 | \$0                 | \$0                 | \$0                 |
| RTI - 2018 Competition                                       | \$0                 | \$0                 | \$0                 | \$0                 |
| <b>RTI - TOTAL</b>   | <b>\$0</b>          | <b>\$0</b>          | <b>\$0</b>          | <b>\$0</b>          |
| THEORY - COMMITTED   | \$2,682,800         | \$2,128,600         | \$1,136,000         | \$550,000           |
| THEORY - 2018 Competition                                    | \$0                 | \$0                 | \$0                 | \$0                 |
| <b>THEORY - TOTAL</b>  | <b>\$2,682,800</b>  | <b>\$2,128,600</b>  | <b>\$1,136,000</b>  | <b>\$550,000</b>    |
| EXP OPS** - COMMITTED  | \$10,952,470        | \$4,053,957         | \$2,255,000         | \$1,867,000         |
| EXP OPS - 2018 Competition                                   |                     |                     |                     |                     |
| <b>EXP OPS - TOTAL</b>                                       | <b>\$10,952,470</b> | <b>\$4,053,957</b>  | <b>\$2,255,000</b>  | <b>\$1,867,000</b>  |
| MRS - COMMITTED  | \$1,673,000         | \$265,500           | \$0                 | \$0                 |
| MRS - 2018 Competition                                       | \$0                 | \$0                 | \$0                 | \$0                 |
| <b>MRS - TOTAL</b>   | <b>\$1,673,000</b>  | <b>\$265,500</b>    | <b>\$0</b>          | <b>\$0</b>          |
| <b>TOTAL - COMMITTED</b>                                     | <b>\$15,308,270</b> | <b>\$6,448,057</b>  | <b>\$3,391,000</b>  | <b>\$2,417,000</b>  |
| <b>TOTAL - 2018 Competition</b>                              | <b>\$0</b>          | <b>\$0</b>          | <b>\$0</b>          | <b>\$0</b>          |
| <b>GRAND TOTAL</b>   | <b>\$15,308,270</b> | <b>\$6,448,057</b>  | <b>\$3,391,000</b>  | <b>\$2,417,000</b>  |
| <b>TOTAL ENVELOPE</b>  | <b>\$24,833,911</b> | <b>\$25,036,331</b> | <b>\$25,407,251</b> | <b>\$25,383,651</b> |
| <b>REIMBURSEMENT - FORWARD BORROW FROM PAST COMPETITIONS</b> | <b>\$96,588</b>     | <b>\$0</b>          | <b>\$0</b>          |                     |
| <b>AVAILABLE</b>   | <b>\$9,622,229</b>  | <b>\$18,588,274</b> | <b>\$22,016,251</b> | <b>\$22,966,651</b> |



# Round 1

- Members in conflict of interest leave the room
- Presentation by the **first internal reviewer**
- Any new or different comments by the **second internal reviewer**
- Budget related comments by the **third internal reviewer** (only for applications requesting >\$500k per year)
- Discussion by the **entire Section** (or sub-Section)
- Secret electronic voting

Any member or NSERC staff may “flag” an application.

Members are asked not to tally results to avoid biases.

# Round 1

- Full Section deliberations
  - Experimental Individual and Project applications
  - Major RTI applications (Category 2 & 3)
  - Major MRS applications (> \$500k/yr)
- Sub-Section deliberations (in parallel)
  - Theory applications
  - RTI-Category 1 & MRS applications
- Conclusion of Round 1
  - Re-discussed any flagged applications
  - NSERC personnel tally & present the budget

# End of Round 1

- Available Funds: \$9.622M\*
- Requested: \$12.977M
- Recommended in Round 1: \$10.037M
- Balance: - \$0.415M

\*Adjustments to ongoing awards resulted in an increase in the available funds

- For Round 2
  - Same set of principles applied to all proposals
  - All proposals again assessed strictly on their merits
  - Account taken of the four evaluation criteria ratings for each proposal (recorded in Round 1)
  - NSERC personnel tallied the budget



# End of Round 2

- Available Funds: \$9.622M\*
- Requested: \$12.977M
- Recommended in Round 2: \$9.625M
- Balance: **-\$3k**

\*Adjustments to ongoing awards resulted in an increase in the available funds

- Quota of one (1) Discovery Accelerator Supplement (DAS) for the SAPES in 2018.

# Multiyear Commitments at End of Competition

| <b>SUBATOMIC PHYSICS ENVELOPE</b><br><b>MULTI-YEAR COMMITMENTS BY CATEGORY</b><br><b>End of Round 2</b> |                     |                     |                     |                     |
|---|---------------------|---------------------|---------------------|---------------------|
|   | 2018                | 2019                | 2020                | 2021                |
| RTI - COMMITTED   | \$0                 | \$0                 | \$0                 | \$0                 |
| RTI - 2018 Competition  | \$301,716           | \$0                 | \$0                 | \$0                 |
| <b>RTI - TOTAL</b>  | <b>\$301,716</b>    | <b>\$0</b>          | <b>\$0</b>          | <b>\$0</b>          |
| THEORY - COMMITTED  | \$2,682,800         | \$2,128,600         | \$1,136,000         | \$550,000           |
| THEORY - 2018 Competition   | \$465,000           | \$482,000           | \$488,000           | \$449,000           |
| <b>THEORY - TOTAL</b>   | <b>\$3,147,800</b>  | <b>\$2,610,600</b>  | <b>\$1,624,000</b>  | <b>\$999,000</b>    |
| EXP OPS** - COMMITTED   | \$10,952,470        | \$4,053,957         | \$2,255,000         | \$1,867,000         |
| EXP OPS - 2018 Competition  | \$8,141,000         | \$8,337,000         | \$8,155,000         | \$229,000           |
| <b>EXP OPS - TOTAL</b>  | <b>\$19,093,470</b> | <b>\$12,390,957</b> | <b>\$10,410,000</b> | <b>\$2,096,000</b>  |
| MRS - COMMITTED   | \$1,673,000         | \$265,500           | \$0                 | \$0                 |
| MRS - 2018 Competition  | \$717,471           | \$728,955           | \$740,817           | \$0                 |
| <b>MRS - TOTAL</b>  | <b>\$2,390,471</b>  | <b>\$994,455</b>    | <b>\$740,817</b>    | <b>\$0</b>          |
| <b>TOTAL - COMMITTED</b>  | <b>\$15,308,270</b> | <b>\$6,448,057</b>  | <b>\$3,391,000</b>  | <b>\$2,417,000</b>  |
| <b>TOTAL - 2018 Competition</b>   | <b>\$9,625,187</b>  | <b>\$9,547,955</b>  | <b>\$9,383,817</b>  | <b>\$678,000</b>    |
| <b>GRAND TOTAL</b>  | <b>\$24,933,457</b> | <b>\$15,996,012</b> | <b>\$12,774,817</b> | <b>\$3,095,000</b>  |
| <b>TOTAL ENVELOPE</b>   | <b>\$24,833,911</b> | <b>\$25,036,331</b> | <b>\$25,407,251</b> | <b>\$25,383,651</b> |
| REIMBURSEMENT from past FY  | \$96,588            | \$0                 | \$0                 | \$0                 |
| <b>AVAILABLE</b>  | <b>-\$2,958</b>     | <b>\$9,040,319</b>  | <b>\$12,632,434</b> | <b>\$22,288,651</b> |

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

# Share of Envelope at End of Competition

## Comparison to Past Years

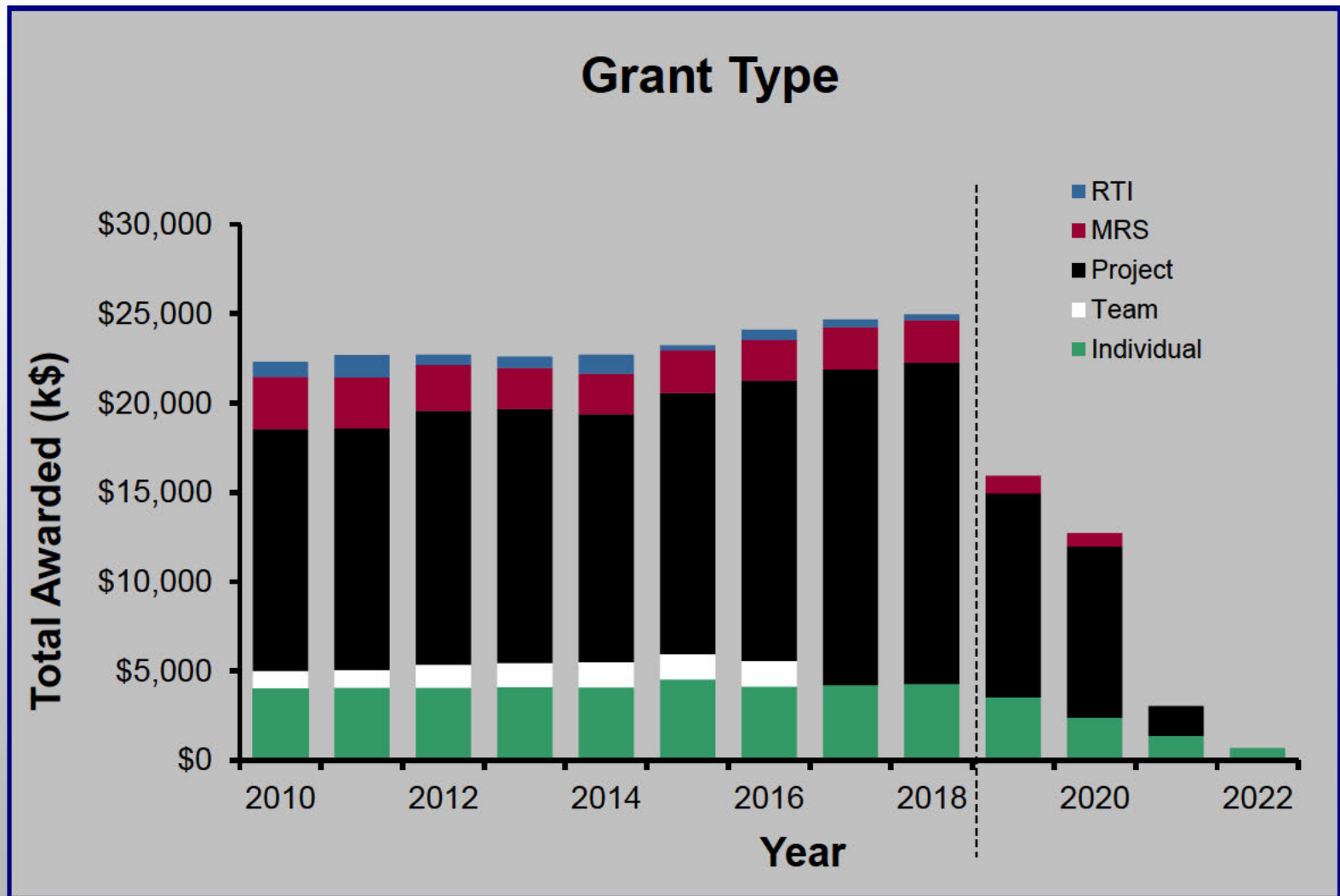
### Subatomic Physics Evaluation Section Evolution of Envelope's Shares

|                           | 2018   | 2017   | 2016   | 2015 | 2014 | 2013 | 2012 | 2011 | 2010 |
|---------------------------|--------|--------|--------|------|------|------|------|------|------|
| <b>Theory</b>             | 12.62% | 13.23% | 14.01% | 15%  | 14%  | 14%  | 14%  | 14%  | 14%  |
| <b>RTI</b>                | 1.21%  | 1.72%  | 2.34%  | 1%   | 5%   | 3%   | 3%   | 6%   | 4%   |
| <b>Total Research Ops</b> | 86.17% | 85.05% | 83.65% | 84%  | 81%  | 83%  | 83%  | 80%  | 82%  |
| <b>Exp. Ops</b>           | 76.58% | 75.42% | 74.22% | 74%  | 71%  | 73%  | 72%  | 68%  | 69%  |
| <b>MRS</b>                | 9.59%  | 9.63%  | 9.43%  | 10%  | 10%  | 10%  | 11%  | 13%  | 13%  |

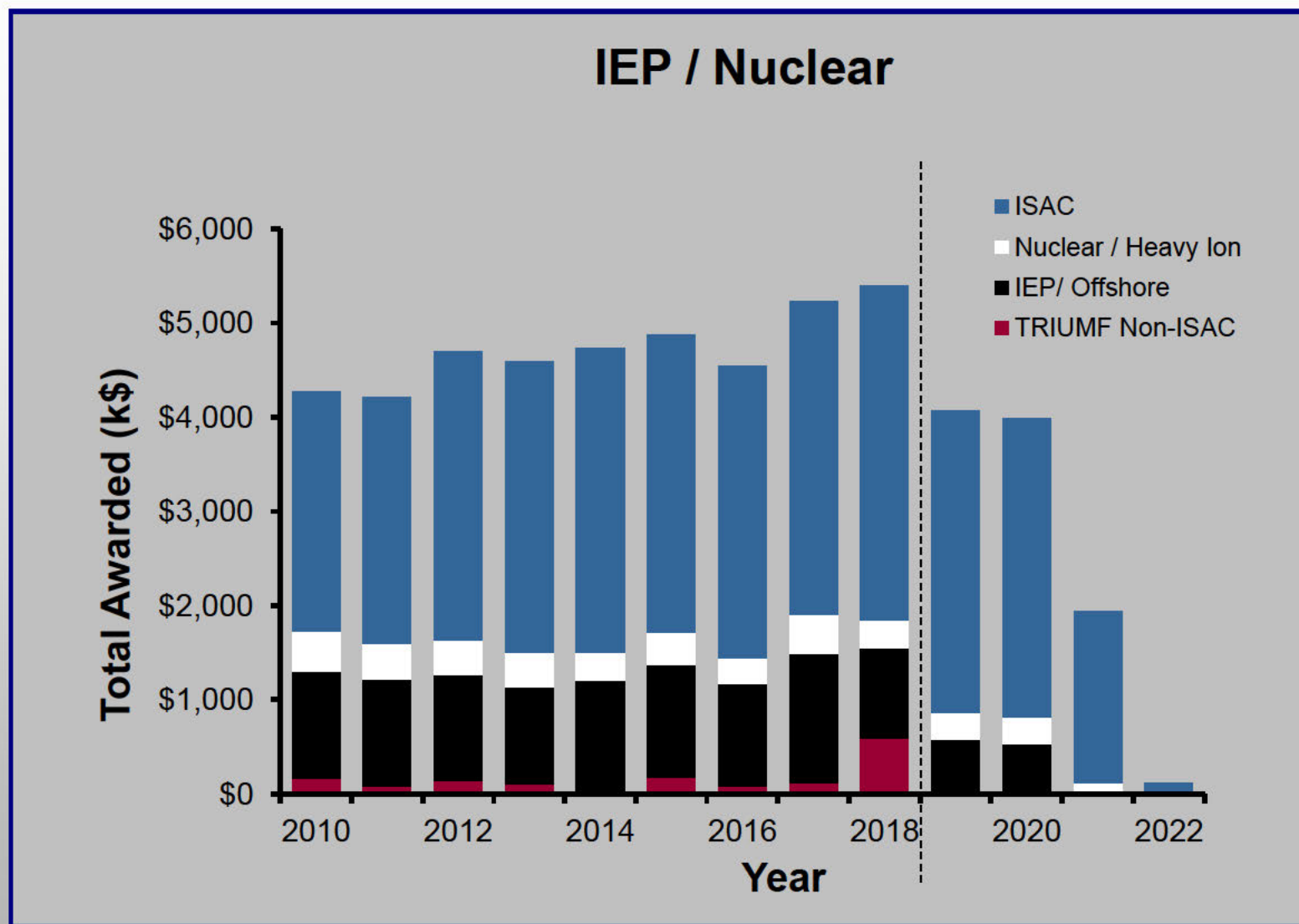
*Takes into account the Federal Budget 2017 increases.*



# Evolution of SAPES Awards

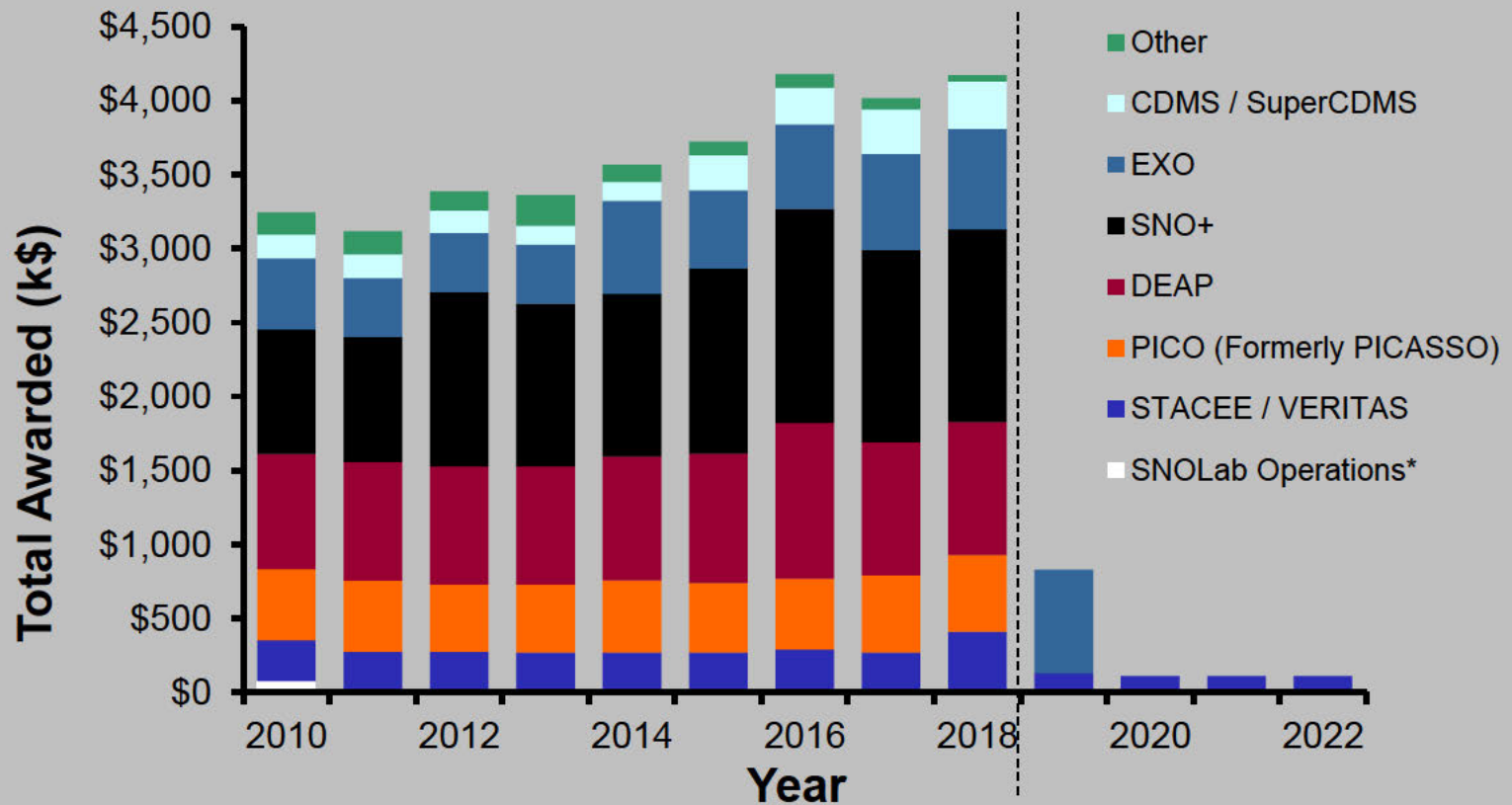


# Evolution of SAPES Awards



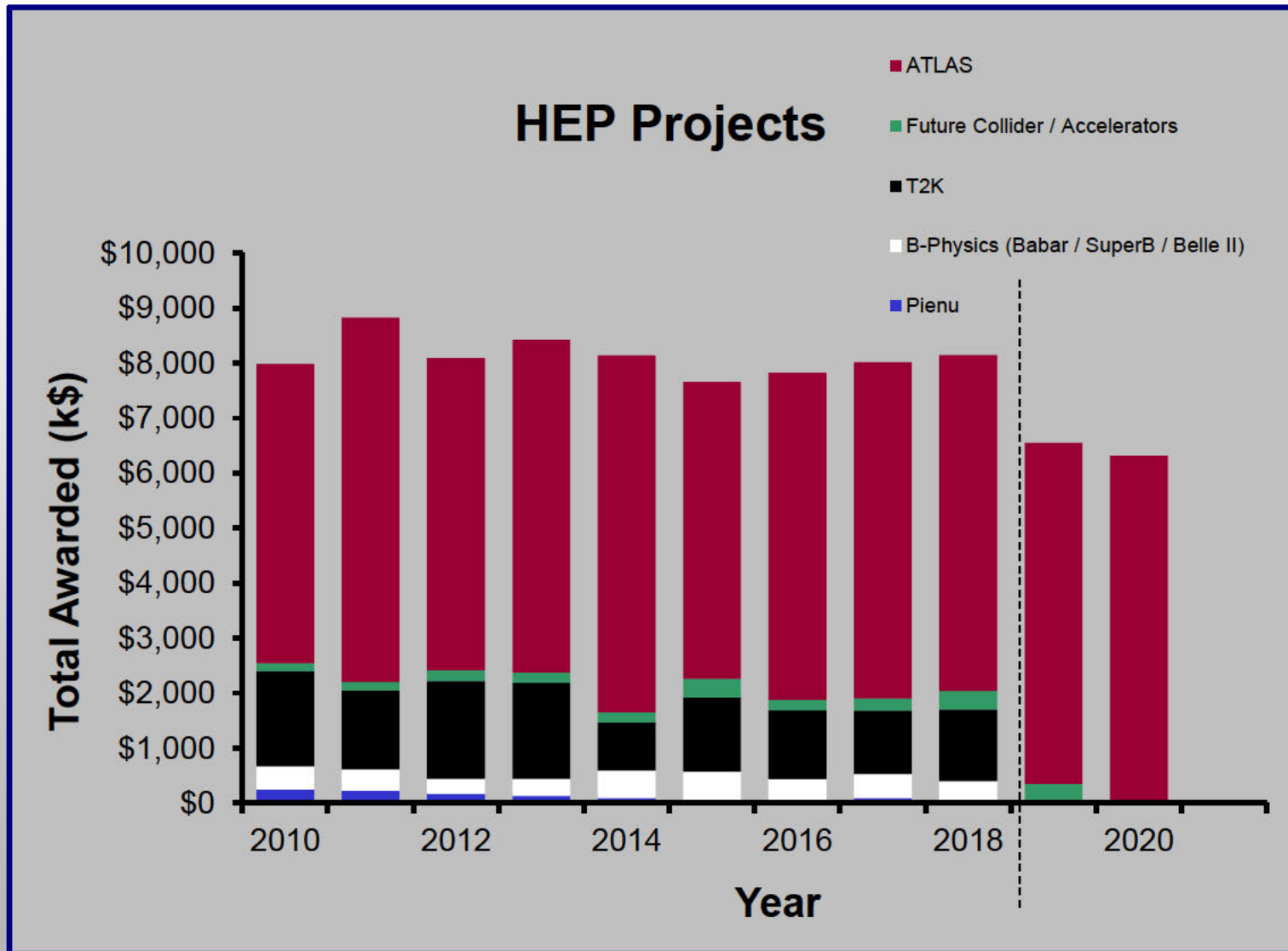
# Evolution of SAPES Awards

## SNO / SNOLAB / Particle Astrophysics

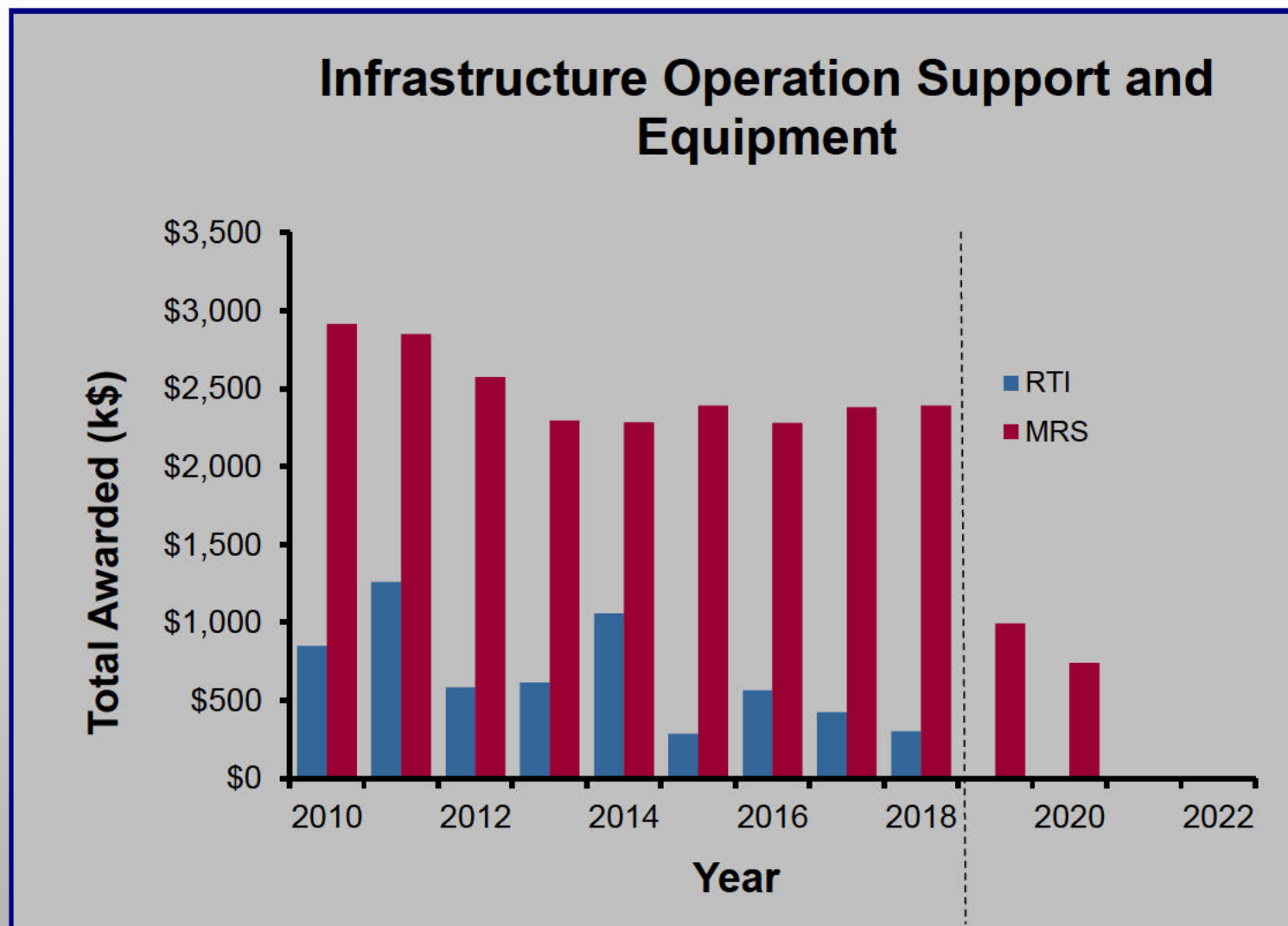




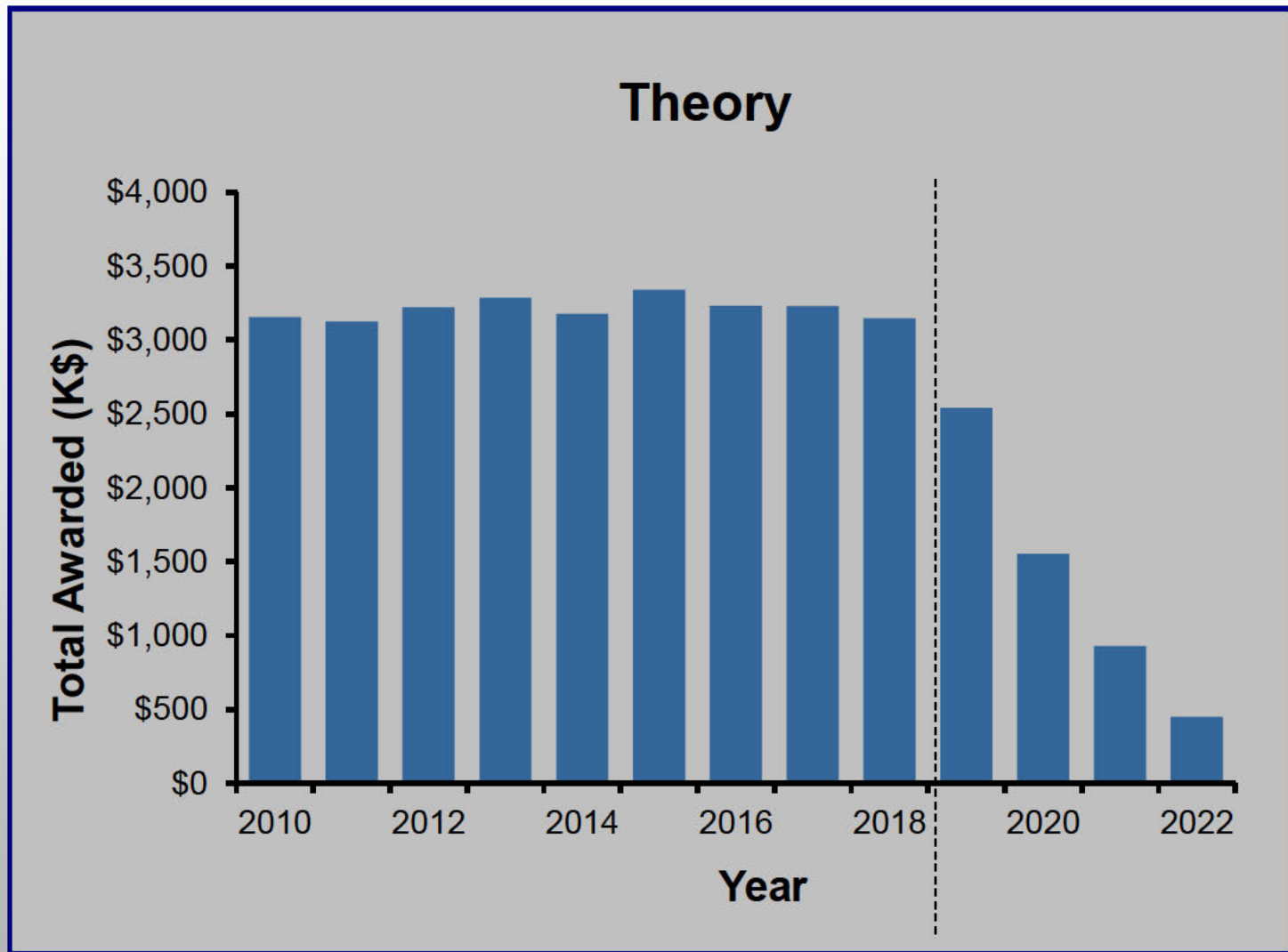
# Evolution of SAPES Awards



# Evolution of SAPES Awards



# Evolution of SAPES Awards

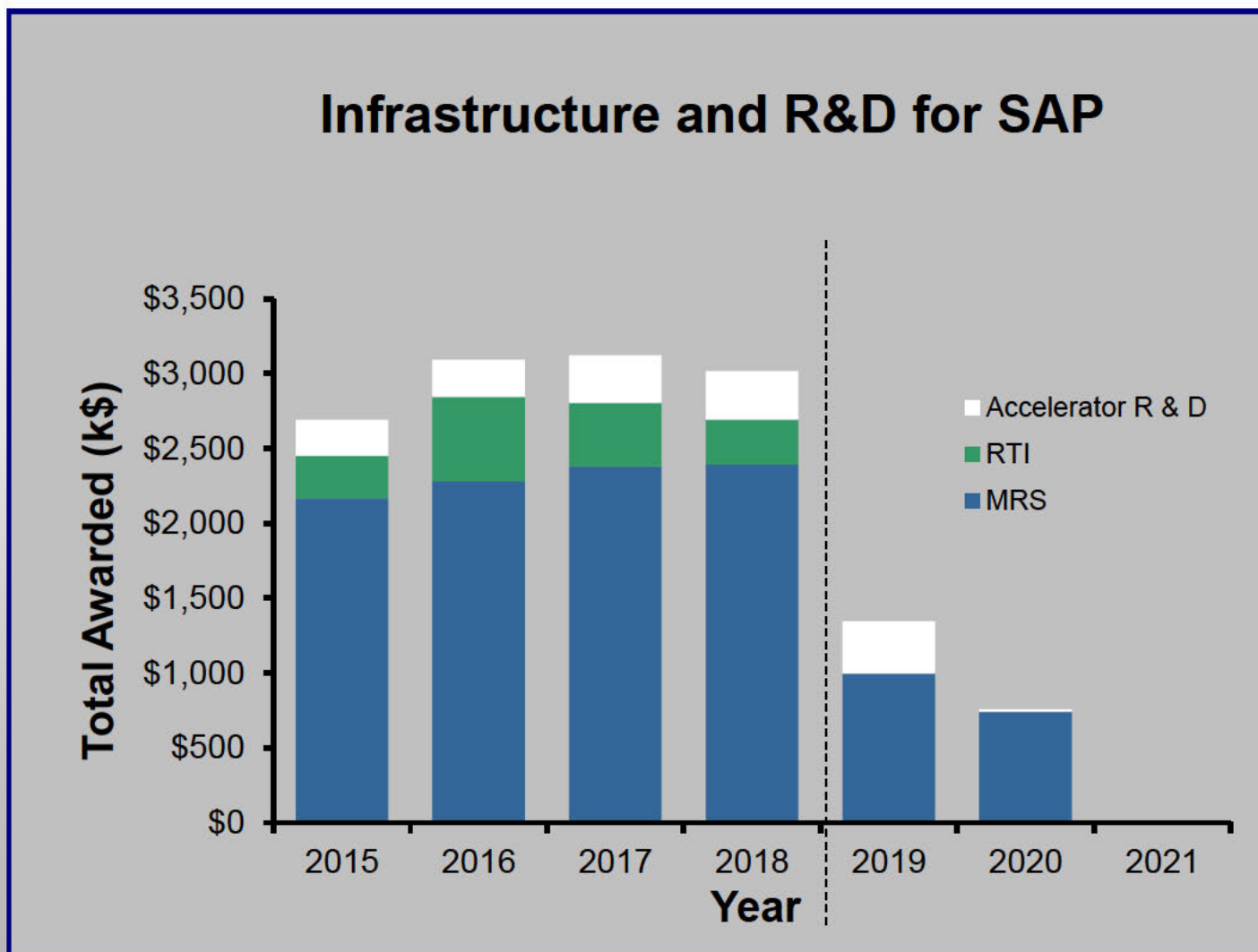




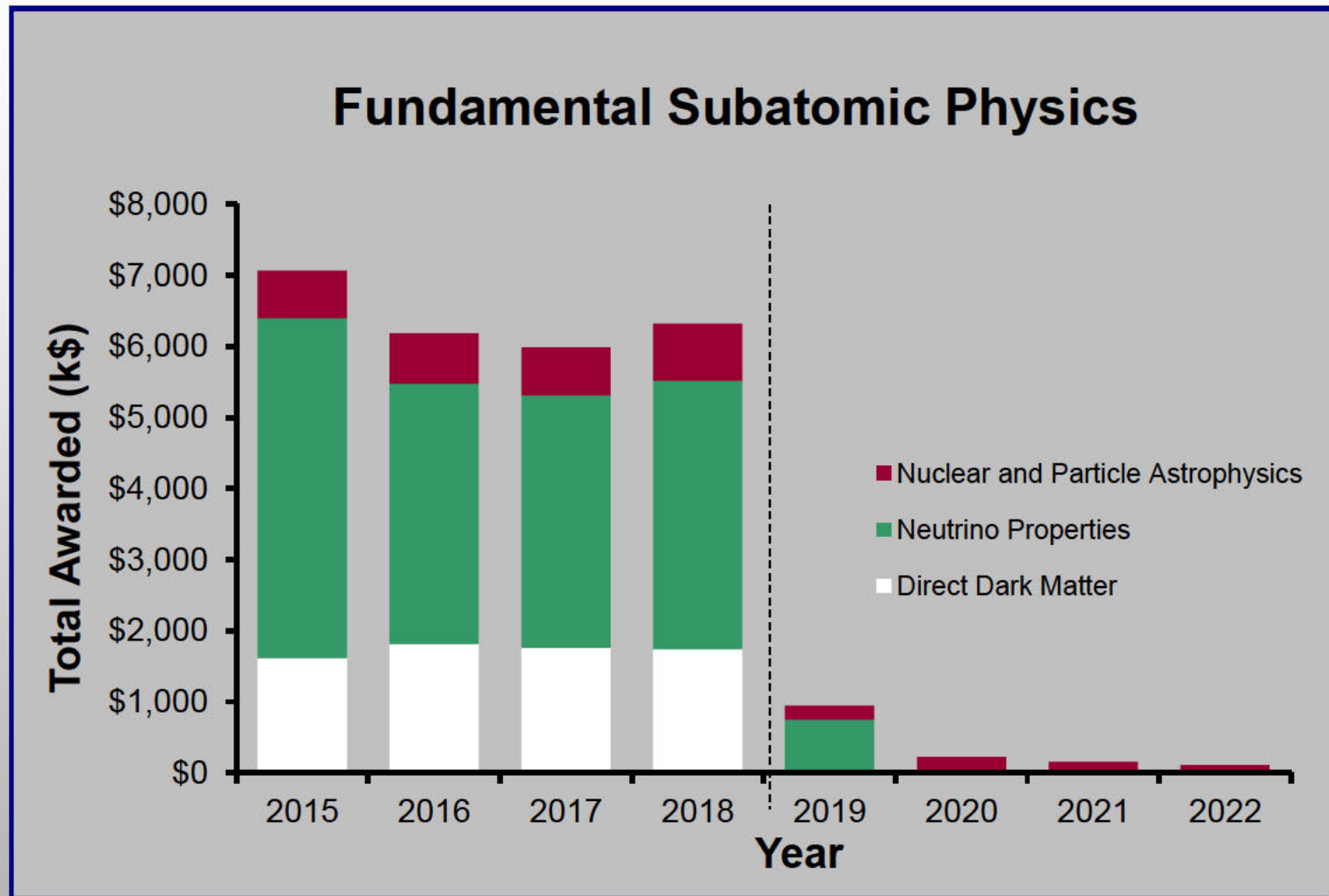
# LRP 2016 Categories

- Accelerator R&D
- Direct Dark Matter
- Energy Frontier
- MRS
- Neutrino Properties
- Nuclear and Particle Astrophysics
- Precision Frontier
- RTI
- Strongly Interacting Matter
- Theory

# Evolution of SAPES Awards

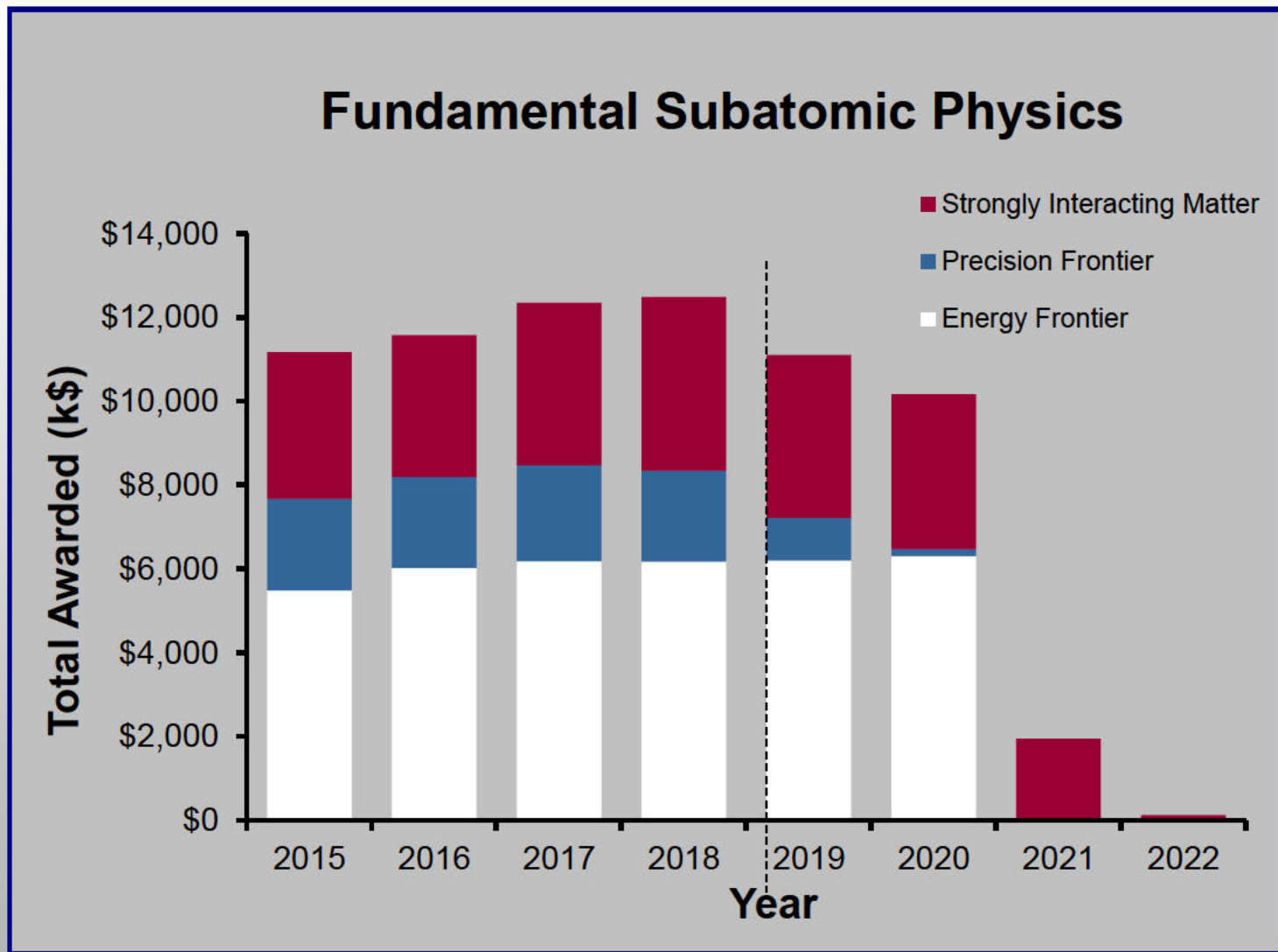


# Evolution of SAPES Awards





# Evolution of SAPES Awards



# Policy Matters

- Mario Pinto, Pierre Charest and Elizabeth Boston attended this session in part or in whole.
- Recommendations to NSERC included:
  - It was confirmed that all information presented during the **orientation conference call** was necessary. SAPES members recommended breaking up the content into two parts spaced out over a longer time, in order to facilitate more discussion, and reduce the length of the call.
  - SAPES members found the **calibration session** very helpful during their assessment and recommendations. SAPES recommended holding this session 3-4 weeks prior to competition week.
  - SAPES to provide feedback to NSERC regarding proposed descriptions for the **Merit Criteria ratings**: Exceptional, Outstanding, Very Strong, Strong, Moderate and Insufficient specifically for evaluation of Project grant applications.
  - SAPES members agreed that ***in camera* presentations by applicants** at Large Project Day were more effective than virtual presentations.

# Budget 2016

From the Federal budget tabled on March 22, 2016:

“Budget 2016 proposes to provide **an additional \$95 million per year, starting in 2016–17, on an ongoing basis** to the granting councils—the highest amount of new annual funding for discovery research in more than a decade”.

- \$30 million annually is proposed for NSERC;
- these funds are being phased into the Discovery grants program over the five-year cycle;
- the increases to the SAP envelope being \$772k, \$1,152k, \$1,132k, \$1,503k and \$1,874k in FY2016-2020 respectively.



# Budget 2018

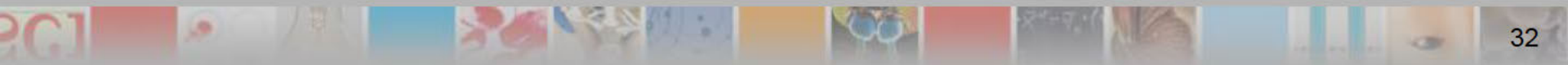
## From the 2018 Federal Budget:

The Government proposes to invest \$925 million over five years, starting in 2018–19, and \$235 million per year ongoing:

- \$354.7 million over five years (\$90.1 million per year ongoing) to NSERC.
- Proposes to create a new tri-council fund to support research that is international, interdisciplinary, fast-breaking and higher-risk.
  - \$275 million over five years, starting in 2018–19, and \$65 million per year ongoing, for this innovative approach

*\*Information related to budget amounts is not being shared outside of the envelope. Permission was received for this group given the nature of the awards (projects, different programs, etc.)*

*(Numbers may change once the Budget 2018 money is allocated.)*





# Passing the baton to ...



**Hans Kraus**

**University of Oxford**



**Brigitte Vachon**

**McGill University**

**SAPES Co-Chairs of the 2019 Competition  
which will take place the week of Feb 24, 2019**

# Additional Details

# 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, after which NSERC confirms the assignment of the application to the Subatomic Physics Evaluation Section, and assesses 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
- By late September Members provide their comfort level to review each application;
- Together NSERC and Section Co-Chairs selects members to be 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> (where appropriate) internal reviewers;
  - First internal reviewer selects external reviewers** (Discovery – Individual & Project)
    - Mix from applicant' s list and others
    - No conflicts of interest (for example no applicants or co-applicants currently applying)
    - Mix of Canadian and International reviewers

# 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 and Project Discovery applications requesting less than an average of \$500k per year
- NSERC and SAPES Co-Chairs identify proposals for Expert Reviews
  - One- to two-day review by an international committee of experts
  - Could include Section members (except 1<sup>st</sup> internal reviewers)
  - Section Co-Chair (or alternate) 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
  - October 24, 2017 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 (< \$500k/yr) typically 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
  - 3<sup>rd</sup> reviewers (for applications requesting > \$500k/yr) carry out an in-depth assessment of the budget

# 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
    - For **four** applications, SAPES received expert input from members of the Physics EG and Math & Stats EG with relevant expertise



# Round 3 – 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.
- The SAP Section directly recommends candidates, in agreement with a set quota.
- Quota of one (1) for the SAPES in 2018.



# Interaction with CFI

- Increased attention and effort made by both agencies
- Regular interactions between NSERC and CFI
  - Meeting on Feb. 29<sup>th</sup> 2016 between SAPES Chair, NSERC and CFI to discuss issues raised through the 2017 LRP process;
  - SAPES Co-Chair & NSERC Team Leader participated as *ex officio* members during part 1 of CFI's Expert Review Committee in December 2016;
  - CFI provided reference data to NSERC on request, specifically a list of all SAP-related CFI applications under review;
  - CFI representatives participated in LPD 2017 as presenter and then as observer throughout afternoon.

# Canadian representation on SAPES

## Proposed approach to applying Tri-Council COI policy for multi-investigator applications review by SAPES

For project, operations and equipment grants submitted to SAPES for review, NSERC will examine each potential conflict (with input from the Chair or another member of the Section as needed) to determine if a real or perceived conflict exists.

In determining if a collaboration and therefore conflict of interest exists, NSERC will focus on demonstration (or not) of shared funding which could be impacted by:

- the distinction between co-applicants and co-users;
- the distinction between primary faculty appointments and various institutional affiliations;
- the distinction between non-research publications (reviews, commentaries) and publications of research results;
- the structure of a network or group with shared funds, as well as the intent of the funding, and method by which funds are distributed.

If an exception is made to current guidelines, the conflict will be disclosed to all members at the beginning of deliberations.



# Canadian representation on SAPES

Starting point – summary of points raised by SAP community in 2015 re: interpretation of COI policy

- NSERC recognizes the importance of Canadian representation on the Evaluation Section, as emphasized by SAPES members and the broader research community.
- Several barriers exist, including **Conflict of Interest guidelines**.
- Feedback was received from SAPES, 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

## Approach to Recruitment

During the membership process for 2017 NSERC:

- Developed a plan looking 5 years ahead;
- Began recruiting Canadian experimentalists years in advance of the actual start date of their membership term in order to:
  - ensure optimal timing for these members with respect to their other responsibilities (i.e. they agree);
  - abide by the Tri-Council Conflict of Interest policy without losing many members during a particular year due to renewal of project grants;
  - achieve a better balance related to institutional, geographic, gender and other representation factors.



# Changes to SAP Programs

Effective for the 2017 Discovery Grants competition, NSERC **no longer accepts** Subatomic Physics - Team grant applications.

- This is consistent with the phase-out of team grants in the Discovery Grants program in 2016.
- Applicants are encouraged to continue to incorporate collaborations into their individual applications, or through project grants.
- Existing team grants continue to receive support until their last installment.