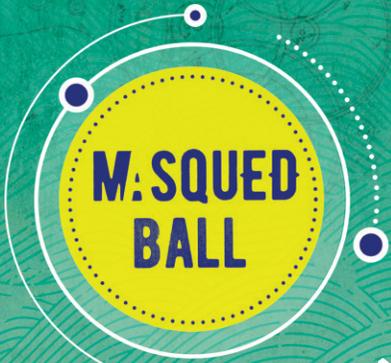


25<sup>th</sup> EDITION

Science  
on tour<sup>e</sup>!

scienceontourne.com 



MAY 6, 2017

NATIONAL FINAL • CÉGEP GARNEAU

INTERCOLLEGIATE  
SCIENCE  
CONTEST



An event of



CENTRE DE DÉMONSTRATION  
EN SCIENCES PHYSIQUES

Major partners



# THE CHALLENGE

Build an autonomous machine capable of picking up golf balls and placing them in a container.

## PARTICIPATE IN **SCIENCE, ON TOURNE!**

### PROFESSIONAL CATEGORY

This category is open to any student – youth or adult – enrolled at a public or private college in Québec in a full-time or part-time program in any discipline regardless of whether the program is offered through regular or continuing education.

### AMATEUR CATEGORY

This category is open to any staff member employed at any public or private college in Québec.

### HOW TO SIGN UP

- Create your team (no more than 3 participants per team) at your own college. All members of your team must be enrolled at the same college because you will all represent your college if it moves on to the national final. An individual student cannot belong to more than one team or submit more than one machine.
- The team members must be the same for the local and national final.
- Contact the student services office to get the name of the person in charge of the contest at your college or of your local organiser. Complete the registration form that person gives you and return it to him or her. The same person will be responsible for sending your registration form to the *Science, on tourne!* team.
- Each participating team must give its vehicle an original name. The same name has to be used for both the local and national final. Trademarks and registered marks may not be used.



## LOCAL FINALS

**JANUARY 11 TO APRIL 14, 2017**

Each institution organises its own local finals during which teams compete in their respective categories (*Professional* or *Amateur*). Each college is responsible for forming the jury that will evaluate the performance of the teams competing in the local contest.

It is up to each participating college to decide what prizes will be awarded to the winners of the local finals.

The winning team at each college will be invited to participate in the national final (one team per college per category).

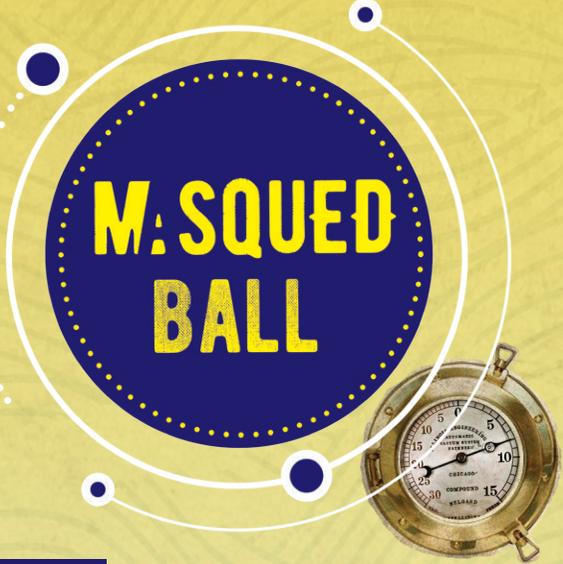
## NATIONAL FINAL

**MAY 6, 2017 AT THE CÉGEP GARNEAU**

The national final bring together the winners in the *Professional* category from each college. The public is invited to attend the event. The *Amateur* category winners will get together for a friendly evening competition at the same venue the evening before, on Friday.



Canal Savoir will be on the spot at the national final to bring you the highlights of this edition. Stay connected to see the broadcasting schedule.



# M. SQUED BALL

## THE CHALLENGE

- 1.1. Build an autonomous machine capable of picking up golf balls and placing them in a container.

## SCORING FORMULA

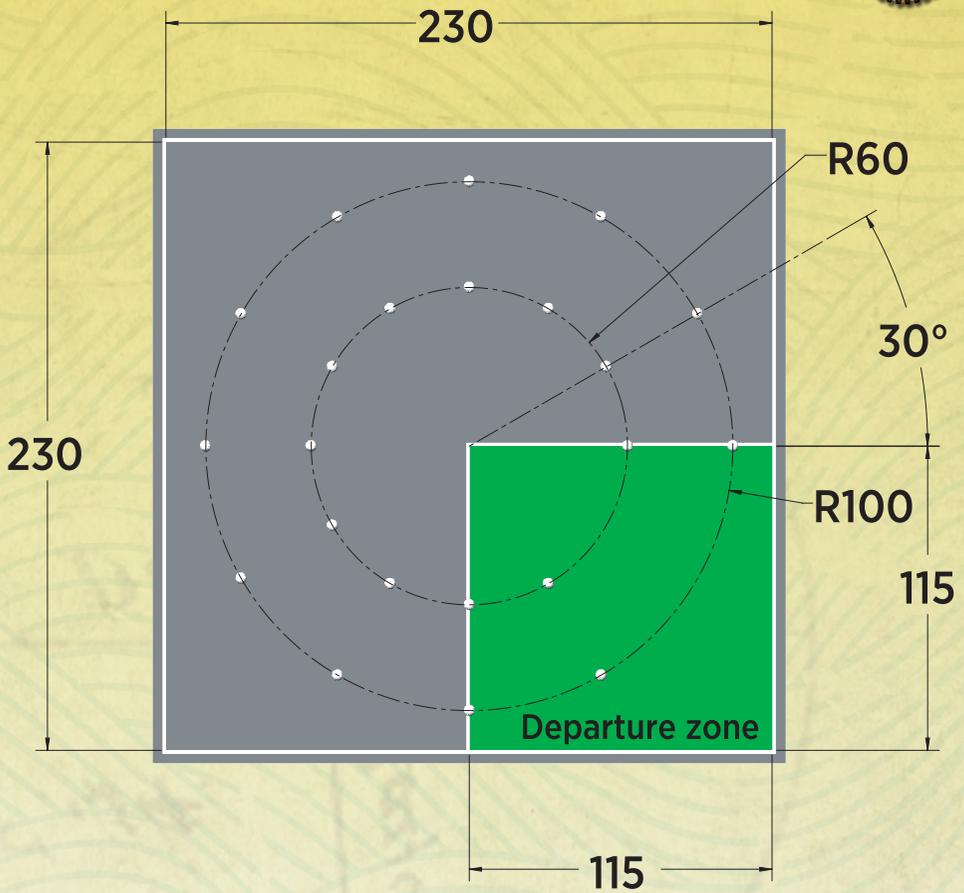
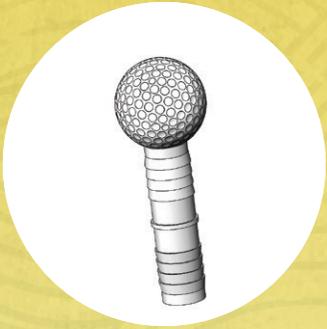
$$\text{Points} = (5 \times P) + R$$

- 2.1. P: Number of balls placed in the container by the end of the attempt.
- 2.2. R: Number of picked-up balls that are on the machine but do not touch the floor at the end of the attempt.
- 2.3. Two official 60-second attempts will be allowed for scoring purposes. The total number of points obtained during the best attempt will be kept.
- 2.4. In the event of a tie, the time that has elapsed between the beginning of the official attempt and the moment when the last ball is moved will be used to determine the winning team. The advantage will go to the team with the shorter time.



## PLAYING AREA

- 3.1. The playing area is a square surface composed of a departure zone, 22 position markers, 22 ball supports, 22 balls and a container.**
  - 3.1.1. The square surface measures 230 cm x 230 cm; the surface is outlined using white tape stuck on the floor outside the boundaries of the surface (see drawing).
  - 3.1.2. The departure zone is a square measuring 115 cm x 115 cm; the zone is outlined using white tape stuck on the floor outside the boundaries of the surface.
  - 3.1.3. The position markers (22) indicate the spots where the ball supports will be placed. Eleven markers will be placed 60 cm from the centre of the playing area and the other 11 will be placed 100 cm from the centre. Each marker will be separated from the markers to either side of it by an angular distance of 30 degrees. For the national final,  $\frac{3}{4}$ -inch (1.9 cm) stickers will be used to show the positions of the ball supports.
  - 3.1.4. The 22 ball supports are polyethylene barb fittings, the type commonly used in plumbing, with a  $\frac{3}{4}$ -inch (1.9 cm) diameter and measuring  $2\frac{7}{8}$  inches (7.3 cm) in height.
  - 3.1.5. The 22 balls are regulation golf balls, unmodified and placed on the supports. They are provided for the challenge.
  - 3.1.6. The container is a box that would normally hold 5,000 sheets of letter-sized paper measuring  $8\frac{1}{2}$  x 11 inches (21.6 x 27.9 cm), without its lid. This box is provided for the challenge and measures 22 cm in height x 45 cm in length x 29 cm in width ( $\pm 1$  cm). For the beginning of the attempt the team may place the box wherever it wishes inside a circle with a radius of 60 cm formed by the position markers.



# RULES

**A team can be disqualified or lose an attempt if it fails to comply with one or more of the following rules:**

- 4.1. Any form of energy other than combustion may be used. Using lithium battery is forbidden.
- 4.2. At the beginning of the official attempt, except for the elements that make up the playing area, anything in contact with the floor in the departure zone constitutes the machine. The machine may be composed of several separate parts.
- 4.3. Other than the playing area components, only the machine may be in the playing area during an official attempt.
- 4.4. When the team tells the referee it is ready for an official attempt, the machine must be stationary and rest on the ground only in the starting area. Between this moment and the beginning of the official attempt, the machine may not be in contact with the container, the balls or their supports. The team may no longer touch the vehicle until it is started.
- 4.5. The machine must be started by means of a single action, using one hand only. A tool may be used to start the machine.
- 4.6. During the attempt, the machine may move the container, the balls and the ball supports.
- 4.7. The container's opening must face upwards at all times.
- 4.8. The machine's operation must not pose any danger to people nor be likely to damage either the playing area or the competition premises.
- 4.9. The machine, the tools and the rest of the technical material must fit into no more than 2 separate boxes that would normally each hold 5,000 sheets of letter-sized paper measuring  $8\frac{1}{2} \times 11$  inches (21.6 x 27.9 cm). The boxes must be separate and no larger than their original dimensions when closed.

The organisers of the local finals can adapt the conditions so they are different from those set for the national final. However, it would be better to comply as much as possible with the rules that will be applied during the national final. The *Science, on tourne!* steering committee is not responsible for any rule-related changes made for the local finals.



# NATIONAL FINAL

## BEFORE THE COMPETITION

- 5.1 On the evening before the competition, each team – whether competing in the *Professional* or *Amateur* category – must have the compliance of its machine verified.

## DURING THE COMPETITION

- 5.2 The order in which the teams will participate will be chosen randomly.
- 5.3 Each team will have five minutes in a designated area off stage to assemble and prepare its machine. A table and power outlet will be provided for this purpose.
- 5.4 When invited to do so by the competition host, the team will place its material in the presentation area and will then have two minutes to give its oral presentation.
- 5.5 Before the beginning of each team's turn, the playing area will be arranged as shown on the playing area drawings.
- 5.6 At the beginning of their turn, the competitors will have 3 minutes to set up so they can:
  - 5.6.1 Set up and prepare their machine.
  - 5.6.2 Move the container if they wish to do so.
  - 5.6.3 Perform one or more (unofficial) attempts.
  - 5.6.4 If any of the balls or ball supports are moved, they have to be returned to their initial positions by the team before they move on to the next step.
- 5.7 Before the end of the 3-minute set-up time, a team representative tells the referee that the team is ready for an official attempt while the rest of the team withdraws with the excess material.
  - 5.7.1 The clock for the 3-minute set-up time is stopped.
  - 5.7.2 From that point on, the team representative must no longer touch the machine until the referee blows the whistle signalling the start of the official attempt.
- 5.8 The referee checks the playing area and ensures compliance with rules.
- 5.9 A whistle is blown to announce the beginning of the 60-second official attempt.
- 5.10 The team representative may then perform the starting action.
- 5.11 The official attempt may be interrupted by the team if it wishes. The points obtained by then are counted for this attempt, if applicable.

- 5.12 After a first official attempt, if there is still time remaining in the 3-minute set-up time, and the team wants to perform a second official attempt, it must remove its machine from the playing area so the items in it can be returned to their initial positions by the officials. During this time, the team cannot touch their machine. Once the playing area has been properly arranged, the referee starts up the set-up time again during which time the team can prepare its machine for their second official attempt, beginning with step 5.6.1.
- 5.13 The best score obtained for the two official attempts is used to establish the team's ranking.
- 5.14 The five teams that obtained the best scores qualify for the final round.

## FINAL ROUND

- 5.15 The competition steps are repeated, starting from step 5.5, but the teams have only 30 seconds to complete each official attempt.
- 5.16 The winning team is determined by the score obtained for its best final round attempt.

## SAFETY FIRST!

We strongly recommend that contestants wear protective equipment such as safety glasses and gloves while they're making their vehicle.



During the national final, any answers published on our website in the *Frequently asked questions* section could be used to make sure a competitor's machine meets the rules. After having read this document, if you still have questions, please feel free to ask them via the competition website [www.scienceontourne.com](http://www.scienceontourne.com)



**PARTICIPATE IN SCIENCE, ON TOURNE!**

**MANY VALUABLE PRIZES!**

**GOOD LUCK EVERYONE!**

## **PRIZES AND AWARDS**

At the national final, these prizes will be awarded to the winners in the *Professional* category only. Visit the website for more details about the criteria.

### **Challenge Award**

A **\$1,000** prize will be presented to each member of the team that gets the highest score.

*Offered by the ministère de l'Économie, de la Science et de l'Innovation.*

### **Free registration for the Science and Society Forum**

Each member of the challenge's winning team will receive **free registration** for the International Science and Society Forum.

*Offered by Acfas.*

### **Women's Participation Award**

A **\$500** award will be presented to a female student whose name is drawn randomly from amongst those of all female participants in the *Professional* category in the local finals.

*Offered by the ministère de l'Éducation et de l'Enseignement supérieur.*

### **Men's Participation Award**

A **\$500** award will be presented to a male student whose name is drawn randomly from amongst those of all male participants in the *Professional* category in the local finals.

*Offered by the ministère de l'Éducation et de l'Enseignement supérieur.*

### **Ingenuity Award**

A **\$1,000** award will be presented to the team whose vehicle is outstanding for its ingenious concept, reliability and details.

*Offered by the Ordre des technologues professionnels du Québec.*

### **Design Award**

A **\$1,000** award will be presented to the team whose vehicle is outstanding for its visually pleasing appearance, the quality of its manufacture and easy operation.

*Offered by Norda Stelo.*

### **Eco-responsibility Award**

A **\$1,000** award will be presented to the team that has best implemented the 3 Rs (reduce, re-use and recycle), and used energy and materials most responsibly.

*Offered by Hydro-Québec.*



## Communication Award

This bursary will be awarded to a team for the quality of its communication, transmission of its message and use of the French language. Each member of the winning team will receive a **\$1,500 travel bursary** to participate in a scientific visit in 2017. To be eligible for this award, the teams must write a text in French presenting their vehicle.

*Offered by the Offices jeunesse internationaux du Québec (LOJIQ).*

## Award of Merit

A **\$1,000** award will be presented to the team that earned distinction in the following five categories: performance of their vehicle, ingenuity, design, eco-responsibility and communication (oral and written).

*Offered by the Fédération des cégeps.*

## BURSARIES

Only participants in the *Professional* category at the national final are eligible for these bursaries; the winners will be chosen by means of a draw.

Visit the website for more details.

One **\$4,000** tuition fee bursary

*Offered by Université Laval.*

One **\$1,000** tuition fee bursary

*Offered by the École Polytechnique de Montréal.*

One **\$1,500** tuition fee bursary

*Offered by the École de technologie supérieure.*

## Jury's Choice Award

A **\$1,000** award will be presented to a team designated by the jury during the national final. The selection criteria for this prize are chosen by the members of the jury.

*Offered by the Centre de démonstration en sciences physiques.*

## People's Choice Award

A **\$1,000** award will be presented to the winning team chosen by public vote during the national final.

*Offered by the Trottier Family Foundation.*

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**FOR INFORMATION ABOUT THE EVALUATION CRITERIA USED TO DESIGNATE AWARD WINNERS, PLEASE VISIT THE PRIZES SECTION OF OUR WEBSITE.**

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## PARTICIPATION PRIZES

**Two trips for two people** to James Bay in 2017.  
*Offered by Hydro-Québec.*

**A discovery day** with **Norda Stelo** engineers and technicians – a unique opportunity to prepare your life plan!

Each participant in the *Professional* category at the national final will receive a **one-year subscription to the magazine, Québec Science.**

And that's not all! Other participation prizes, offered by Université Laval and Acfas, will be awarded by random draw. All participants present at the national final are eligible for this draw.

Major partners



Gold partners



Silver partners



Bronze partners



**THANK YOU TO  
ALL OUR PARTNERS!**