

# CANADIAN-AMERICAN-MEXICAN

## Graduate Student Physics Conference 2017

**August 17 - 19, 2017**

Hyatt Regency Washington  
On Capitol Hill  
Washington, D.C.

Nuclear Physics  
Particle Physics  
Accelerator Physics  
Astrophysics  
and Cosmology  
Biophysics  
Soft Matter  
Condensed Matter  
Nanotechnology



### SPECIAL SESSIONS ON:

“Physicists Transcending  
Boundaries: Geographical,  
Disciplinary, and Career”

“Physicists Transcending  
Boundaries: Personal and  
Societal”

**Physicists of the Future:**  
Transcending Boundaries



[go.aps.org/2017cam](http://go.aps.org/2017cam)

**Abstract Deadline:**

**April 28, 2017**

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## Statement of Task

### 2017 Canadian-American-Mexican Graduate Student Physics Conference (CAM2017)

#### **I. Background**

The Canadian-American-Mexican (CAM) Graduate Student Physics Conference is a bi-annual international scientific meeting designed by and for physics graduate students. The success of the CAM series is the product of more than two decades of collaboration among the American Physical Society (APS), the Canadian Association of Physicists (CAP), and the Sociedad Mexicana de Física (SMF). The first joint meeting of these physical societies was held in September 1994 in Cancun, and was intended to bring together North American physicists to share scientific and cultural ideas that may lead to collaboration. A decade later, after successfully hosting three joint international conferences, the CAM sponsors made a decision to organize the conference exclusively with and for graduate students, and this is the model that persists today. Since planning began for the first graduate student conference (CAM2003), staff from APS, CAP, and SMF have guided their graduate student associates in working together to organize and host the conference. The student organizing committee is an international team, whose diverse nature ensures each meeting benefits from the ideas and insights of both CAM-veterans and first-time planners. The resulting meetings highlight current issues and advances in physics and society through invited plenary sessions, panel discussions, and student research presentations. This up-to-date, original scientific programming keeps each meeting unique—a feat also aided by the rotating location of the CAM meetings: CAM2017 will be hosted in Washington, D.C., USA, since the 2015 and 2013 meetings were in Oaxaca, Mexico and Waterloo, Canada, respectively.

One of the primary goals of the CAM conferences is to encourage collaboration and cooperation among physicists in the three host countries. Conference participants spend three days together sharing science stories, learning from each other, comparing graduate school experiences, and becoming inspired for a future where they are scientific leaders. Such an energetic and collegiate atmosphere can help spark ideas for new projects or collaborations. The conference provides a supportive environment for just this kind of interaction, and organizers actively promote continued interactions after the meeting by hosting online forums for the conference participants. Indeed, such online forums have been a successful feature of CAM conferences since 2005.

The conferences have consistently attracted highly qualified, diverse student participants, who each contribute to the conference scientifically through either oral or poster presentations. The invited speakers have been distinguished and equally diverse, including academics, politicians, industrial scientists and even astronauts.

#### **II. Objectives**

CAM2017 is, above all, a platform for graduate students to share their own scientific research achievements and learn about those of their international peers. Each student participant will present his or her research through either a contributed talk or a poster presentation. The rich variety of research topics (and subsequently low average audience familiarity with each topic)

requires student speakers to tailor their talks for a general physics audience. This is good scientific communication practice for the presenters, and it also provides the audience a rare opportunity to learn a topic outside their own subdiscipline from another graduate student.

In addition to student research presentations, major subdisciplines in current physics research will be addressed with invited talks during the five plenary sessions. The plenary talks will be given by senior scientists from the USA, Canada, and Mexico and will cover the following topics: 1) Nuclear, Particle, and Accelerator Physics; 2) Astrophysics and Cosmology; 3) Biophysics & Soft Matter; 4) Condensed Matter & Nanotech; 5) Earth, Energy & Environment. Plenary speakers will be encouraged to attend the whole conference and spend time socializing with the graduate students during breaks, the poster session, the conference banquet, and the networking reception.

“Physicists of the Future: Transcending Boundaries” is the theme of CAM2017, and it will be explored throughout the conference program as a professional development exercise. “Transcending Boundaries” is an intentionally broad phrase, since each physicist has his or her own personal boundaries that are overcome in pursuit of science. This could be as literal as crossing a geographical border for a new experiment or as abstract as starting to explore a new discipline as research results lead outside the realms of “traditional” physics. For some, the most important crossing may be of the unconscious societal boundary that has historically prevented many women and minorities from excelling in physics. For others it might be making a leap into a new and unfamiliar career outside of academia. Common to all, transcending a boundary in pursuit of science is an exciting signifier of a next great step. CAM2017 will use this idea to encourage conference attendees to energize their career plans and actively seek out opportunities to explore new territories.

Concretely, this will be done by providing a welcoming setting for students to communicate their research and by encouraging a dialogue among conference attendees. It is expected that some CAM participants will be presenting their research publicly for the first time at the meeting. An audience of their peers should make this process less intimidating and will likely provide the presenter with good critical feedback on how to improve. For other presenters, CAM will be their last conference before a final thesis defense. It will provide a platform for them to summarize their graduate research achievements, and completing a presentation experience with an audience of international peer scientists will help them segue into the next step of their education and/or careers. For the first time in CAM history, all presenters will be invited to participate in a voluntary peer feedback program. Participating students will write and submit objective and respectful observations about each presentation they attend. In return they will each receive at the end of the conference a written collection of detailed peer feedback. This feedback will be a great resource for students hoping to improve their presentation skills. In addition to practicing science communication during formal presentations, CAM2017 participants will also have the opportunity to network and discuss science with the invited speakers and panelists. This early experience of approaching top scientists will be advantageous when participants network later in their careers.

Equally as meaningful are the professional development opportunities enjoyed by the students on the International and FGSA/APS Organizing Committees. The student organizers learn many important lessons while planning, organizing and hosting an international conference. Some of

these lessons are concrete (i.e., considering all the details such as programming, finances, advertising, etc. that go into conference planning) while others are more abstract (i.e. learning how to communicate effectively across cultures with peers and senior advisors). Mentoring from and collaboration with representatives from APS, CAP, and SMF is a rare experience for graduate students and it establishes connections and experiences that will support many aspects of a healthy future physics career. In particular, it is hoped that the experience of planning CAM2017 will inspire graduate students to remain active in leadership roles within the scientific community. Indeed, graduate student organizers for past CAM conferences, who are now professional scientists, have served in leadership roles within international advisory committees of APS (i.e., the Committee on International Scientific Affairs, the Committee on International Freedom of Scientists, and the Forum on International Physics).

CAM2017 will help promote new international connections and collaborations by providing an opportunity for students to interact internationally in a supportive environment. This conference is unique because it brings together, in the absence of pressures from professors and advisors, physics graduate students studying in the United States, Canada, and Mexico. These student participants are able to freely share their research achievements, compare their experiences as graduate students, and learn about scientific opportunities available to them in North America's three largest countries. Such interactions are likely to spark new ideas for collaborations or inspire a graduate student to pursue research opportunities abroad in the future.

In addition to helping to form new collaborations and networks among students, the CAM conferences also nurture the existing working relationship among the physical societies in Canada, Mexico, and the United States. CAP and SMF have worked together with APS for decades; this biennial graduate student conference is a joint effort that each organization eagerly anticipates. The rotating hosting responsibility gives each country an opportunity to showcase its educational, industrial, and governmental scientific efforts and attract top students. Working together toward a common, and enjoyable, goal gives these physical societies a shared mission, strengthening both the ties among the physical societies and the scientific infrastructure within North America.

Also, for the first time in CAM history, the FGSA and the APS Office of International Affairs have issued a special CAM2017 invitation to a delegation from Cuba, including 17 students. This invitation was extended in recognition of the 2015 restoration of diplomatic relations between the U.S.A. and Cuba after more than 50 years of strained relations. It is with the greatest hopes for future scientific cooperation with Cuba that these students will be welcomed to Washington, D.C.

### **III. Conference structure**

The CAM2017 program will include five plenary sessions with invited speakers, four breakout sessions for parallel student talks, a poster session for student presentations, two panel discussions featuring invited speakers, and a keynote banquet. The keynote speaker will be invited from the U.S.A. and will be chosen based on his or her demonstration of “transcending boundaries” within physics, the conference theme. The keynote speech will be held during the Conference Banquet on Capitol Hill on the second night of the conference. The plenary sessions will feature two invited speakers each from five different physics subdisciplines, including 1) Nuclear, Particle, and

Accelerator Physics; 2) Astrophysics and Cosmology; 3) Biophysics & Soft Matter; 4) Condensed Matter & Nanotechnology; and 5) Earth, Energy, and Environment. Of the 10 invited plenary speakers, 3 will come from each the U.S., Canada, and Mexico, while one has been invited from Cuba.

Of the estimated 100 student participants, it is expected that 60 will give oral presentations and 40 will present during a dedicated poster session. The breakout sessions will each consist of three parallel sessions of student research presentations. Each of these sessions will be chaired by students and will feature 5 or 6 student presentations. Each student oral presentation will be 10-12 minutes followed by 3-5 minutes for questions from the audience. The presentations will be categorized and scheduled based on the abstracts received, and will mostly fit into the following sub-disciplines: 1) Particle Physics, 2) Astrophysics and Nuclear Physics, 3) Condensed Matter Physics, 4) Biophysics, 5) Optics, 6) Atomic Physics, 7) Nanoscience, 8) Computational Physics, and 9) Materials Physics. The students who do not give a talk will present during a dedicated poster session on the second afternoon of the conference.

Each student will be invited to participate in a voluntary peer feedback program. The program structure will ensure that all feedback is objective and respectful. Specifically, participating audience members will be asked, for each presentation, to write down one thing they saw, one thing they heard, one thing they felt, one thing the speaker did particularly well, and one thing the speaker could improve. The idea is that simple objective observations like these, when provided by 15-30 people, can help identify a speaker's best, worst, or most distracting communication habits. The feedback forms will be collected and distributed at the end of the conference.

CAM2017 will also feature two panel discussions that will further explore the conference theme. One panel will focus on scientific boundary crossing, including multidisciplinary research, international collaborations, and transitions from academia to industry. The second panel will delve into the personal boundary crossing necessary to "become" a physicist. For example, panelists may discuss the challenges of overcoming "imposter syndrome" or advise graduate students on methods they use to overcome challenging problem or banish a bad working habit. Each panel will be comprised of speakers from the U.S., Canada, and Mexico to ensure that the discussion is relatable to all participants. The panels, an hour and 20 minutes each, will be moderated in the first half and open to the questions from the audience in the second half.

In summary, the CAM2017 program offers plenary sessions, breakout sessions for parallel student talks, panel discussions and opportunities for networking with fellow students and senior scientists at the banquet and coffee breaks.

#### **IV. Funds from the National Academy of Sciences/U.S. Liaison Committee for the International Union of Pure and Applied Physics**

Funds from the National Academy of Sciences/U.S. Liaison Committee for the International Union of Pure and Applied Physics would help support the attendance of approximately 25 participants from Mexico. Funds would be used to cover hotel costs and local expenses such as meals during the conference and local transportation.