# University of Regina
# Department of Physics
# Academic Unit Review
# 2026

### External Reviewers:

Dr. Jeffery W. Martin, Department Chair and Canada Research Chair in Fundamental Symmetries in Subatomic Physics, University of Winnipeg

Dr. Alexandros Gezerlis, Professor of Physics, University of Guelph

### Internal Reviewer:

Dr. Phillip Choi, Dean and Professor, Engineering and Applied Science

### Site visit dates:

March 30-31, 2026

## Executive Summary

The Physics Department at the University of Regina has a well-deserved reputation as a leader in the field of subatomic physics in Canada. Its faculty members have been extremely successful in attracting external funding and maintaining valuable partnernships with research institutions in Canada and abroad. The unit is one of the smallest physics departments in the country offering a wide array of programs from the BSc all the way to the PhD level. It also provides a sizable service to the University by teaching a large number of engineering and other students.

The Department has established a vibrant program of outreach, with a special emphasis on supporting diversity in Physics.

## Teaching & Learning

The Department of Physics at the University of Regina offers programs leading to B.Sc. and B.Sc. Honours degrees in physics, applied and industrial physics, and M.Sc. and Ph.D. degrees in experimental and theoretical subatomic physics. It is one of the smallest physics departments in Canada that offers such a wide spread of degrees. Co-operative Education programs with local industry are a significant component of the undergraduate programs; graduates students asked whether it would be possible to offer analogous opportunities for grad students pursuing a non-academic trajectory post-PhD.

The undergraduate degree in physics is a 4-year program consisting of 120 credit hours. This involves focus on standard physics subjects (mechanics, optics, electricity and magnetism, modern physics, thermal and statistical physics, quantum mechanics), but also electives (like nuclear or mathematical physics), as well as valuable courses that are not universally encountered at the undergraduate level (health physics, general relativity). The Department has averaged about 4.5 students per semester enrolled in the Co-op program over the past 10 years, with job placements at institutions like the Allan Blair Cancer Center and AREVA Resources Canada. The 10-year average of students enrolled in all undergraduate physics programs is 42. This student-to-instructor ratio is favourable for the students, and provides opportunities for research-based learning that are not universally available in physics departments across Canada.

The Physics Department has an outsized contribution in terms of teaching service classes, primarily for programs in the Faculty of Science and Faculty of Engineering and Applied Science. The 54 experiments at the 1st and 2nd-year physics labs are supervised and taught by two lab instructors, and ~20 graduate student teaching assistants. A promising new program has emerged, allowing students to access their laboratory equipment remotely, either at the University of Regina or at Kwantlen Polytechnic University in BC. A challenge is posed by the decrease in enrollment in first year physics courses (from ~1000 to ~700 between the years 2015 to 2025), largely driven by Engineering enrollment (e.g., the restructuring of the Petroleum Engineering program).

Graduate course offerings address core subjects, while also reflecting the department's research focus on subatomic physics. There are currently 18 graduate students, a number which has increased as a result of the 4 new faculty hires since the previous academic unit review (there were 11 graduate students in 2015). One of the faculty members (Huber) won the University's 2024 Award for Outstanding Graduate Supervision. Graduate students have been awarded competitive grants from NSERC and the Canadian Institute of Nuclear Physics (CINP). Highlights include the JSA/Jefferson Lab PhD thesis award for analysis of the neutral b1 meson at GlueX (Suresh, 2023) and a Vanier Scholarship to study hadron structure at JLab (Postuma, 2024).

Students go on to a number of productive occupations, of which the ones most often mentioned in discussions were Photon Science Staff at Brookhaven National Lab, Radiation Physicist at the Allan Blair Cancer Clinic, Health Physicist at Cameco, or Data Scientist at Farm Credit Canada.

More specifically, our **recommendations** are to:

1. Innovate in high-school student recruitment, which has the potential to increase the physics-major population (which is currently healthy) by a sizable fraction.
2. Introduce a new undergraduate course on computational physics; this was the sole lacuna in the impressive undergraduate curriculum mentioned by students; such a new course would benefit from the expertise of existing faculty (Vujanovic) or future hires.
3. Make a concerted effort, together with the Faculty of Engineering and Applied Science, to seek accreditation for the Applied Physics (Engineering Physics) B.Sc. program; this promises to dramatically bolder enrollment and further highlight the many successes of the department in applied research.
4. Ensure that the service lab offerings are more evenly distributed across the two semesters, thereby mitigating the current logistical challenges. First-year class enrollment could also be bolstered if appropriate engineering and other classes are taught.
5. Work with Engineering to increase the number of Physics electives available to Engineers (aimed at increasing enrolments in upper-level physics courses).
6. Find a practical solution that allows students access to the physics club door; a quote of $4,000 has been already received (and rightly ignored), but a solution still awaits.

# Research

The Physics Department at the University of Regina has a well-deserved reputation as a leader in the field of subatomic physics in Canada. The department made the strategic decision to

focus on subatomic physics, and this has led to a tightly knit department that works well together. There have been numerous, notable research contributions in experimental studies related to hadron physics (Huber, Papandreou), neutrinos (Barbi, Kolev), and rare isotopes (Grinyer). The department has more recently expanded into applied nuclear physics (Berg, Teymurazyan) and subatomic theory (Ouimet, Vujanovic). The excellence of the research program is one of this committee's key findings.

We found the research lab space to be adequate for each research group. Impressive technical progress in the experimental physics program was displayed in the labs we toured. This has enabled the researchers to build custom high-tech components of larger experimental apparatus at TRIUMF, JLab, CERN, and in Japan. The components are then shipped to the relevant laboratory, installed, and supported long-term by the Regina researchers, as the experiments are conducted. Another example was in Teymurazyan's lab, where PET and CT scanners for plants have been constructed and commissioned, prior to being shipped to the Fedoruk Centre (Saskatoon) for installation and operation. The instrumentation in the research laboratories was entirely funded from external sources. The availability of lab space has been crucial for the Regina researchers to have an impact in their respective fields. The research lab space is also crucial for graduate student training in experimental physics.

The loss of the machine shop in Science has had a negative impact on the program. This could turn into a benefit for local industry in Regina, where local machine shops are now being trained by the Regina researchers to fabricate custom equipment for their experiments. Several 3D printers have also been purchased in the department and are used to fill the gap.

The Department has been extremely successful in attracting external funding. The self-study noted a total of over $14M in external funding over the past 10 years, which is very impressive for a department of this size. The most recent example is a large $1M+ CFI Innovation Fund grant to Huber, et al.

We understood from discussions with Regina senior administrators that the University of Regina seeks to move from being a research-active to a research-intensive university. The Physics Department is recognized as a leader toward this goal. The involvement and knowledge displayed by the administrators we met was impressive, from the President, VPR, Provost and AVPA, to the Dean of Science. It was appreciate, and important, to see photos of the President touring JLab and TRIUMF. The Department is also well-aligned with the University's strategic plan, in the area of Discovery, pushing the boundaries of human knowledge.

We spoke with the Directors of the major laboratories where the research is conducted: JLab, TRIUMF, Fedoruk Centre, CLS. All echoed the sentiment that the researchers from Regina are highly valued and sought after for their expertise.

The Province of Saskatchewan has a goal to increase the role of the nuclear industry in the province. The Physics Department has a strategic importance for the University of Regina, in that it is the only department in the province with practicing nuclear physicists, also offering graduate degrees in experimental nuclear physics.

More specifically, our **recommendations** are to:

7. Retain adequate support for research, including lab space and teaching releases. This will allow the researchers to continue to seek large external funding from various agencies.
8. Continue to negotiate additional joint (bridging) faculty positions with laboratory partners, such as JLab, TRIUMF, and Fedoruk Centre, which are leveraged by research strength.
9. Sustain the relationship with SURA, which has a large benefit for student support and sabbatical leaves at JLab. The JLab relationship is clearly very important and should be retained.
10. The Physics Department has a key strategic advantage in being the only department in the province with practicing nuclear physicists, conducting research in nuclear physics, and training graduate students in the field. This should be recognized and used to develop further leadership roles in the province's push toward the nuclear industry, especially in developing the research capacity in the province.
11. The Physics Department and University should consider ways for the Department to play a role in potential new funding from the Federal Government, for example in technologies important for sovereignty and dual-use technologies. This could be based on their existing strength in particle detectors.

# Service and Outreach

The best-known community service role in the Canadian subatomic physics community has been D. Huber's role in the establishment and leadership (as executive director) of the Canadian Institute of Nuclear Physics (CINP). This has given Regina an outsized impact on subatomic physics in Canada. For example, D. Huber has been involved either as a voting committee member or in an ex-officio role in formulating the last five Canadian subatomic physics long-range plans (every five years, including the current one). This includes leading the authorship of the CINP brief, a report formulated by the Nuclear Physics community as input to the national plan. The long-range plan is used by funding agencies such as NSERC and CFI to

guide decisions on research funding in this field. More recently, Dr. Grinyer has also served as President of the Board of CINP.

Regina's membership in SURA (Southeastern Universities Research Association) is important for the JLab-based research which, with the recent funding of the CFI Innovation Fund grant, is expected only to grow.

The Department is committed to supporting diversity in Physics, with numerous examples coming from their outreach activities. The department recently hosted the Canadian Conference for Undergraduate Women (CCUWiP) in 2023, 2SLGBTQ+ in STEM Canada 2024. The department has focused on engaging students from underrepresented backgrounds, through high-school and girl-guide group visits. The department hosts the annual "STEM for ALL" night of science demos for 2SLGBTQ+ students. They also organize campus wide (public) seminars on 2SLGBTQ+ in STEM Day and the International Day for Women and Girls in Science.

Numerous other community service and outreach activities, including involvement in national and regional science fairs, organization and hosting of Theory Canada 2025, and others, were noted.

Many of these activities act to build community in both the Canadian and International research space, as well as in the local Regina community. The latter of these has the potential to positively affect enrolments in Physics.

More specifically, our **recommendations** are to:

12. Continue to contribute to leadership roles in the Canadian Subatomic Physics community such Dr. Huber's pivotal contributions; Dr. Grinyer's role as President of the Board of CINP is an excellent start. The success of the Regina research program has benefitted from national efforts (in, e.g., CINP) to lead and define the flow of subatomic physics research in Canada. The faculty would be well-advised to take on new opportunities that might coalesce in the future, to retain their leadership in Canada.
13. Continue the excellent efforts in outreach and engaging high-school students, and creating a welcoming environment for 2SLGBTQ+ students. Continue to work to break down stigma and the perception of physics as being too difficult or unwelcoming.
14. We noted that, although there is a strong relationship with First Nations University of Canada, this is confined to the teaching portfolio of the department, and is mostly done by Dr. Sardali in Prince Albert. We think that the department could go further, in seeking out involvement from Indigenous students in Regina. Example ideas to get the department started are: (1) seek one-on-one contact with Indigenous students by visiting Indigenous study or resource centres on the Regina campus, (2) publicize USRA opportunities for Indigenous (and Black) students, (3) once a few gung-ho Indigenous

students have been identified, start an AISES in Canada chapter, (4) seek funding for Indigenous students to attend the National Gathering of AISES in Canada, (5) visit local schools with large Indigenous enrolments (even elementary schools). These activities might involve First Nations University of Canada, or could be pursued independently.

# Staffing & Budget

The staff currently includes 11 assistant/associate/full professors, 2 laboratory instructors, and 1 administrative assistant. This includes one faculty member at Campion College (Lawler), one faculty member based at a different campus (Sardarli), one Canada Research Chair Tier 2 (Vujanovic), and one Fedoruk Chair (Berg). In addition to the past and continuing partnership with the Fedoruk Centre, the department has been exploring the possibility of joint (bridge positions with research laboratories such as Jefferson Lab and TRIUMF.

Overall, there are 9 NSERC-eligible faculty members, who have been producing many research publications and bringing in sizable competitive funding awards (as covered elsewhere in this document).

It is our finding that the department faculty complement had been mostly sufficient to provide a wide array of undergraduate and graduate courses, including many service courses to ~700 students (as detailed in a separate section). This was jeopardized after a recent retirement, when it turned out to be necessary for the department to hire sessional instructors, for the first time in its history who did not always receive proportional TA support. There are two further faculty retirements on the horizon, so it is imperative that these be filled/replaced, possibly ahead of time to prevent further disruption.

The physics department budget is largely made up by physics graduate student teaching assistantships, as well as a fund of $12,000 per year, going to institutional memberships and covering lab equipment needs, among other needs. The department has started offering large service classes later in the evening, thereby generating revenue for the Faculty of Science through the funding model of the Centre for Continuing Education. It is our finding that the lab budget could benefit from annual upgrades, but these should not come at the expense of existing commitments.

Graduate students in the physics department are supported by grants, departmental TAs, Graduate Studies GTAs, Base Funding (GSBF), and Thesis-Only (TOS) funding. In discussions with the committee members, several students expressed frustration about their inability to secure a TA position some semesters (and the limited funds they receive when they do). Similarly, there are funds available (but not always readily) from FGSR, which the students felt were not sufficient.

More specifically, our **recommendations** are to:

15. Aggressively pursue joint positions with JLab, TRIUMF, and the Fedoruk Centre. It is our finding that these institutes were receptive to such discussions, and the Regina administration was similarly receptive.
16. The administration should replace upcoming retirements (Huber, Papandreou); if these positions are unfilled, an unsustainable situation would arise, especially in the face of new courses/programs. Ensure that the historical strengths of the department in subatomic physics are not jeopardized.
17. Increase supports (TA or other) for sessional lecturers teaching large enrolment classes; it stands to reason that the amount of grading support an instructor requires would depend on the order of magnitude of the student population.
18. Introduce a small lab fee to students taking undergraduate physics classes, the funds from which are to be re-invested into physics department lab upgrades. The annual discretionary fund has been small but valuable, so the new funds should augment rather than replace it.
19. Increase the fraction of students who receive TA positions, as well as the stipend each funded student receives. There are currently no guarantees mentioned in the graduate student contracts.
20. Streamline the FGSR travel award procedure, which is currently quite cumbersome; ensure field work is also covered. Introduce Faculty of Science funding to support sending graduate students to international conferences.

# Summary of Recommendations (in order of appearance)

1. Innovate in high-school student recruitment to increase the physics-major population (which is currently healthy) by as much as 50%.
2. Introduce a new undergraduate course on computational physics; this was the sole lacuna in the impressive undergraduate curriculum mentioned by students; such a new course would benefit from the expertise of existing faculty (Vujanovic) or future hires.
3. Make a concerted effort, together with the Faculty of Engineering and Applied Science, to seek accreditation for the Applied Physics (Engineering Physics) B.Sc. program; this promises to dramatically bolder enrollment and further highlight the many successes of the department in applied research.
4. Ensure that the service lab offerings are more evenly distributed across the two semesters, thereby mitigating the current logistical challenges. First-year class enrollment could also be bolstered if appropriate engineering and other classes are taught.
5. Work with Engineering to increase the number of Physics electives available to Engineers (aimed at increasing enrolments in upper-level physics courses).
6. Find a practical solution that allows students access to the physics club door; a quote of $4,000 has been already received (and rightly ignored), but a solution still awaits.
7. Retain adequate support for research, including lab space and teaching releases. This will allow the researchers to continue to seek large external funding from various agencies.
8. Continue to negotiate additional joint (bridging) faculty positions with laboratory partners, such as JLab, TRIUMF, and Fedoruk Centre, which are leveraged by research strength.
9. Sustain the relationship with SURA, which has a large benefit for student support and sabbatical leaves at JLab. The JLab relationship is clearly very important and should be retained.
10. The Physics Department has a key strategic advantage in being the only department in the province with practicing nuclear physicists, conducting research in nuclear physics, and training graduate students in the field. This should be recognized and used to develop further leadership roles in the province's push toward the nuclear industry, especially in developing the research capacity in the province.
11. The Physics Department and University should consider ways for the Department to play a role in potential new funding from the Federal Government, for example in

technologies important for sovereignty and dual-use technologies. This could be based on their existing strength in particle detectors.

12. Continue to contribute to leadership roles in the Canadian Subatomic Physics community such Dr. Huber's pivotal contributions; Dr. Grinyer's role as President of the Board of CINP is an excellent start. The success of the Regina research program has benefitted from national efforts (in, e.g., CINP) to lead and define the flow of subatomic physics research in Canada. The faculty would be well-advised to take on new opportunities that might coalesce in the future, to retain their leadership in Canada.
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20. Streamline the FGSR travel award procedure, which is currently quite cumbersome; ensure field work is also covered. Introduce Faculty of Science funding to support sending graduate students to international conferences.

# Appendix A: Agenda of the Review Committee's Site Visit

University of Regina University of Regina

Academic Unit

**UNIT REVIEW 2025-26**

**Schedule for the Department of Physics**

Review Site Visit: **Monday March 30, 2026**

| Time | Who/What | Participants | Where |
|---|---|---|---|
| **8:10** | **Hotel Pick-up (Zisis)** | **External Review Team** | **The Atlas Hotel** 4177 Albert Street **Fairfield Inn** 3915 Albert Street |
| 8:30 - 9:00 | Opening Coffee | President, Provost, Vice-President (Research), Associate Vice-President (Academic), Department Head | LB 237 |
| 9:00 - 9:20 | Provost and Associate Vice-President (Academic) | david Gregory and Nilgün Önder | LB 237 |
| **9:20 - 9:45** | **Break** | | |
| 9:45 - 10:45 | Meeting with Physics Department | Review Team | LB 237, Zoom |
| 10:45 - 11:15 | Dr. Doug Farenick (Dean of Science) | Review Team | LB 237 |
| 11:15 - 11:45 | Tour of Physics Teaching Labs | Shaun and Stam | LB 132 |
| 11:45 – 12:00 | Student Engagement and Outreach | Mel Hart, Review Committee | LB 237 |
| **12:00 - 1:30** | **Lunch** | **Review Team** | **LB 228** |
| 1:30 - 2:00 | Research Lab Tour | Mauricio, Nikolay | LB 118 |
| 2:00 - 2:30 | Dr. Jens Dilling (JLab Director) | Review Team | LB 228, Zoom |
| 2:30 - 3:00 | Dr. Chris Yost (VP Research) | Review Team | LB 228 |
| **3:00 - 3:30** | **Break** | | |
| 3:30 - 4:00 | Dr. Jeter Hall (Fedoruk Director) | Review Team | LB 228, Zoom |
| 4:00 - 4:30 | Dr. Aziz Douai (Dean of FGSR) | Review Team | LB 228 |
| 4:30 - 4:50 | Physics Sessionals | Gergana, Dilli, Colleen | LB 228 |
| 5:00 - 5:30 | Dr. Nigel Smith (TRIUMF Director) | Review Team | LB 228, Zoom |
| **5:30** | **Social (CW 215) + Refreshments Dinner afterwards** | **Review Team and Department** | CW 215 |
| **7:00** | **Dinner at Memories** | **Review Team & Faculty (Gwen, Zisis, Gojko, +1)** | 1717 Victoria Ave |

**Review Team consists of:**

Dr. Jeff Martin, Professor, Department Chair, Canada Research Chair (Tier 1) in Fundamental Symmetries in Subatomic Physics, University of Winnipeg

Dr. Alexandros Gezerlis, Professor, University of Guelph

Dr. Phillip Choi, Dean and Professor, Engineering and Applied Science, University of Regina

**Schedule for the Department of Physics**

Academic Unit Review Site Visit: **Tuesday March 31, 2026**

| Time | Who/ What | Participants | Where |
|---|---|---|---|
| **8:40** | **Hotel Pick-up** | **External Review Team** | **The Atlas Hotel**<br>4177 Albert Street<br>**Fairfield Inn**<br>3915 Albert Street |
| 9:00 - 10:00 | Morning coffee with students | Review Team, all HQP | LB 239 |
| 10:00 - 10:30 | Research Lab Tour | Zisis, Aram | LB 116/127 |
| **10:30 - 11:00** | **Break** | | |
| 11:00 - 11:30 | Campus Tour | Review Team, Garth | Campus walk |
| 11:30 - 12:00 | Undergrad, Grad, Coop coordinators | Marcella, Zisis, Nikolay | LB 228 |
| **12:00 - 1:30** | **Lunch** | **Review Team** | **LB 228** |
| 1:30 - 2:00 | Mark Boland (Former CLS Director) | Review Team | LB 228, Zoom |
| 2:00 – 2:20 | AUR Committee | Review Team | LB 228 |
| 2:20 – 2:40 | Dean of Campion College | David Meban | LB 228 |
| 2:40 - 3:30 | Review Team Wrap-up | Review Team | LB 228 |

*****This agenda is subject to change.*

*Note the Exit Interview is scheduled virtually for Wednesday April 8th from 1:30-2:30pm (SK time)