

**Physics and Astronomy, Undergraduate and Graduate Programs,
 Faculty of Science**

Cyclical Program Review – 2008 to 2015

Final Assessment Report and Implementation Plan Executive Summary

**Reported to Joint-Committee on Quality Assurance:
 December 4, 2017**

Program Description

A Department of Physics was established at York University in 1964, initially at Glendon College and subsequently at the Keele campus in 1965, as one of the three major participants with Biology and Chemistry in the Interdisciplinary Science (IS) Program. Students were first admitted to master's and doctoral degree Programs in Physics at York in 1968. In the late 1980s, the Department decided to expand its presence in astronomy and astrophysics. The resulting growth in astronomical research activity led in 1991 to the introduction of official Streams of study in astronomy in both the undergraduate and graduate Programs. In 2007 the Department introduced its Undergraduate Program in Biophysics.

The Streams available to BSc students in Physics and Astronomy programs are the following: Physics, Astronomy and Astrophysics, Applied Physics, Space Science. Students at the graduate level pursue an MSc or PhD in Physics or Astronomy.

The Graduate Program offers six fields of research activity:

- Astronomy and Astrophysics (AA)
- Atomic Molecular and Optical Physics (AMO)
- Biological Physics (BP)
- Chemical and Condensed Matter Physics (CCM)
- High Energy and Particle Physics (HEP)
- Earth, Atmospheric, Space and Engineering (EASE)

	Registration (new intake) 2015	Enrolment FTES 2015	Degrees Awarded 2014
Biophysics (BSc)	4	23	7
Physics and Astronomy (BSc)	47	132	11 Hons; 5 90-credit
MSc	15	22	10
PhD	4	27	5



Reviewers appointed by the Vice-Provost Academic:

Dr. Barbara Frisken, Professor, Department of Physics, Simon Fraser University
Dr. Stephen Godfrey, Professor, Department of Physics, Carleton University
Dr. Neal Madras, Professor, Department of Mathematics and Statistics, York University

Documentation Provided to the External Reviewers

Prior to the site visit, the external reviewers are provided with the following:

- Dean's /Principal's Agenda of Concerns
- Department/Program Omnibus Statement (where applicable)
- Program Self-Study Brief, which includes program structure, curriculum and learning outcomes, program reflection, enrolment and retention data, resources, student input and quality enhancement opportunities
- Faculty CVs
- University, Faculty and Program planning documents

Cyclical Program Review - Departmental Process (based on information in the Self Study Brief)

The process of self-evaluation began in the Fall of 2015 with the construction of two surveys, one for undergraduate students and one for graduate students. While the surveys were in the field, the Department Executive developed a plan for a department retreat to ensure dialogue would lead to an actionable set of proposals. Eight themes for discussion were developed and working groups of faculty, staff and students, worked on a theme to identify principal concerns and recommendations. A short summary of the recommendations was circulated before the Departmental Retreat, held at the McMichael Gallery on April 22, 2016. Attendees included the majority of faculty members, graduate students, staff, and one postdoctoral fellow. The retreat included small group discussions about the themes, and the Chair of the Department ended each session by summarizing what he thought represented consensus. The proceedings were recorded for future reference. The Chair of the Department subsequently prepared a draft "agenda of concerns" highlighting areas of the Programs needing improvement or enhancement and putting forward proposals for action. Because the various Programs have overlapping concerns, the agenda of concerns was presented in its entirety after the three Program self-studies rather than being broken up among them. Input from reviewers will assist with the finalization of actions the Programs should take in moving forward.

Site Visit: November 9-10, 2016

The Reviewers first met with Vice-Provost Alice Pitt and Dean of Graduate Studies, Barbara Crow. During the two days the reviewers also met with the Dean of Science, Ray Jayawardhana, Faculty of Science Associate Dean Research, Sylvie Morin, Associate Dean Faculty - Buks van Rensberg, the Chair of the Department, Marshall McCall, the Undergraduate Program Director, Patrick Hall, PHAS GPD - Tom Kirchner, Previous GPD, Wendy Taylor, Science Librarians, John Dupuis, Genny Jon and Acting Associate University Librarian, Adam Taves. The reviewers held meetings with the undergraduate faculty and the graduate faculty, as well as meetings with undergraduate majoring in Biophysics and Physics and Astronomy, and also with graduate students. Professor Paul Delaney provided a tour of the York University Observatory and the reviewers toured the various laboratory facilities. In addition there was a meeting with York University Experience Hub (Technology Internship Program), Kathleen Winningham.

Outcome:

The Joint-Committee on Quality Assurance commended the Department for its well-designed process for developing the self-study. The Dean's Implementation plan, which included the programs' response to recommendations, was very thorough and clear. The committee concluded that the Decanal response adequately addressed the review recommendations. Progress on the recommendations will be included in the Follow-up Report due June 2019. The next CPR will begin in the Fall of 2023.

Strengths:

The reviewers made note of the following about the undergraduate programs: "A large proportion of the courses are taught by full-time faculty – 97% in 2015/2016. This demonstrates a strong commitment on behalf of the faculty to support of undergraduate education and a good alignment between the program needs and faculty resources. Students were highly complementary of the quality of teaching by their physics professors, and of how readily professors made themselves available to students outside of classroom hours."

The Reviewers made note of the following for the research based MSc: "The methods and criteria for assessing student achievement are appropriate and effective relative to the expectations of the discipline and the program learning outcomes. In particular, the annual research evaluation stands out as an especially rigorous approach to assess student progress and achievement."

The Reviewers lauded the Department annual workshop built around the Careers Toolbox developed by the American Physical Society and to an annual careers event with alumni for graduate students and noted that this would also be beneficial for prospective and registered undergraduate students. The Reviewers stated that the proposed workplace practice certificate which would include career-oriented skills is also an excellent initiative.

Reviewer Recommendations and Dean's Implementation Plan

The Review Report provided a fulsome and robust discussion of the materials included in the self-study, the Dean's agenda of concerns, and the challenges and issues that were raised during the site visit.

The reviewers provide a comprehensive set of recommendations for the Programs that is in strong dialogue with the self-study. Each recommendation is preceded by a discussion of the strengths of the program and opportunities for improvement.

In his response, the Dean provides an extensive response document, roughly grouped thematically, which incorporates the Department's response and his own comments, and suggesting actions that might be taken where appropriate and identifying recommendations that are either out of scope for the CPR process or can only be determined once results of initial actions are known.

A significant focus is on recommendations related to curriculum mapping and curriculum review for both undergraduate and graduate programs. The consideration of many suggestions, for example new programs, would be determined after a full consideration of the curriculum mapping exercise.

The Dean's implementation Plan ensures that recommendations related to research be explored immediately. Suggestions related to recruitment are either ongoing or will be undertaken. Space for the program and students, which will foster collegiality and collaboration, among other things, is an ongoing project.

A number of suggestions, acknowledged in the Dean's Implementation Plan, are related to academic hiring, but not all of these lie within the purview of the department or even the Faculty of Science.

The final recommendation of the reviewers is, "That the Department should initiate a Long Range Planning process to set faculty hiring priorities over the next 5 to 10 years." The Department Response, recorded in the Plan includes this statement, "There is a real opportunity for the Department to re-vitalize or even re-define itself, and it is logical to develop a long-range plan on how best to do so. The Dean closes his detailed Implementation plan with this acknowledgement of the importance of this activity with this statement, "The Dean welcomes a Long-Range Planning exercise within PHAS. Along with curriculum mapping, this is key to departmental sustainability and the maintenance of vital programs at both the undergrad and graduate levels."

A report on the progress of these initiatives will be provided in the Follow-up Report which will be due in June 2019.

Alice J. Pitt
Vice-Provost Academic
York University