

October 25, 2002

Professor Carolyn Tuohy
Vice-President, Policy Development
and Associate Provost
Room 206, Simcoe Hall
27 King's College Circle
University of Toronto

Dear Professor Tuohy:

At its meeting of October 22, 2002, the Council of the School of Graduate Studies approved the following motion:

THAT SGS Council receive the Five-Year Review Report of the Collaborative M.Sc. Program in Astrophysics and approve the continuation of the Collaborative Program to July 1, 2007.

The Review Committee's Report and SGS Deans' Response are attached.

On behalf of the Council of the School of Graduate Studies, I am presenting this item to Governing Council for information.

Yours sincerely,

Jane Alderdice
Secretary to SGS Council
and Coordinator of Policy, Program and Liaison

Encl.
/smr

c.c. D. Coombs
R. Desai
C. Dyer
S. Girard
C. Johnston
L. Yee

Motion

School of Graduate Studies Council Tuesday, October 22, 2002

Item 9.

MOTION (/) **THAT** SGS Council receive the Five-Year Review Report of the Collaborative M.Sc. Program in Astrophysics and approve the continuation of the Collaborative Program to July 01, 2007.

See Report of the Review Committee and the SGS Decanal Response attached.

DECANAL RESPONSE to Review of the Collaborative Program in Astrophysics.

The Committee of Deans at SGS was pleased to receive the report of the Committee to Review the Collaborative M.Sc. Program in Astrophysics. The Program Director and the Program Committee are to be commended for developing a very good quality collaborative program.

The two recommendations made by the committee are appropriate: that the Collaborative Program be continued for the next five years, 2002-2007, and that the three participating graduate units should seriously consider extending the program to include a Collaborative Ph.D. Program in Astrophysics.

October 10, 2002

**REPORT OF THE COMMITTEE
TO REVIEW THE COLLABORATIVE M.Sc. PROGRAM
IN ASTROPHYSICS**

Introduction

Physics and Astronomy are strongly allied disciplines with a common intellectual origin. At the University of Toronto, presence of the Canadian Institute for Theoretical Astrophysics (CITA) gave a strong impetus to enhance and formalise the long existing informal collaboration between the Department of Physics and the Department of Astronomy (recently renamed as the Department of Astronomy and Astrophysics). The discussions between CITA and the two departments took place during the mid-nineties, culminating in a memorandum of agreement, signed in January 1997, for establishing the Collaborative M.Sc. Program in Astrophysics. This was approved by the School of Graduate Studies (SGS) and the Academic Policy and Programs Committee at the U. of T. by July 1998. Formal approval by the Ontario Council of Graduate Studies (OCGS) was granted in October 1998 and the first student enrolled in the program during the academic year 1998-99.

Review Committee

As is customary, three years later during the academic year 2001-02, a Review Committee has been established by the SGS, which is reporting to the Vice-Dean, SGS, through this report. The committee consists of

Prof. Rashmi Desai, Associate Dean, Physical Sciences, SGS
Prof. Ray Carlberg, Department of Astronomy
Prof. Jonathan Dostrovsky, Director, Neuroscience Collaborative Program
Ms. Megan McClure, Doctoral Student in Astronomy
Prof. Norman Murray, CITA, and
Prof. John Sipe, Department of Physics.

The committee met on December 7, 2001 to begin the review. At this meeting, the committee received the "Report on the Collaborative M.Sc. Program in Astrophysics" from the Program Director, Prof. Charles Dyer, and discussed with him in detail various operational and academic aspects of the program. The committee also sought, electronically, comments about the program from the students and faculty who participated in the program during the period 1998-2001. As well, the Chairs of the two departments and the Director of CITA were consulted electronically about their views in relation to the Collaborative Program.

The Collaborative Program (CP)

The program is sponsored by the three graduate units: Astronomy and Astrophysics, Physics and CITA, and is intended to foster graduate education in Astrophysics, especially in those areas of study that overlap traditional departmental boundaries.

An application for admission to the CP is made through either the Department of Physics or the Department of Astronomy and Astrophysics. In addition, an applicant submits a supplementary brief application form to the CP director. Students already admitted to either of the two departments may apply to the CP until October 1 of a given academic year.

Graduate students in the CP register through their home graduate unit, either the Department of Physics or the Department of Astronomy and Astrophysics. The student must meet all respective degree requirements of the School of Graduate Studies and the relevant home department. This normally requires the equivalent of 10 half courses as follows: 3 half courses from Astronomy and Astrophysics, 3 half courses from Physics, 2 further half courses in Astronomy and Astrophysics, Physics, or from a cognate department such as Mathematics, Chemistry, Computer Science, and a supervised research project in the field of Astrophysics, equivalent to 2 half courses.

In addition, special to the M.Sc. students in the CP, there is an additional requirement that the student must attend the seminar programme of the Canadian Institute of Theoretical Astrophysics, and prepare a report on a selection of these seminars, to be submitted to the Director. These program requirements are expected to be completed within twelve months of entry to the programme. This time limit has worked for most students.

The collaborative program is described on a webpage which is linked to, and is easily accessible from, the websites of the SGS, Department of Physics and the Department of Astronomy and Astrophysics. The program is administered through a three member program committee made up of one representative from each of the three participating graduate units. Currently its members are: Prof. Charles Dyer (Director), Prof. Norman Murray and Prof. John Sipe. There is no need for any special budget for the CP, since much of the administration is absorbed by the two departments. Publicity for the CP occurs alongside the individual departmental publicity. During the coming years, the administrative and budgetary needs of the CP will continue to be absorbed by the two departments.

The Graduate Students

The CP has been successful in attracting high quality graduate students to the University of Toronto. The existence of the Collaborative M.Sc. Programme in Astrophysics appears to have had an impact on the choice of university by these students for their graduate education. Each of the incoming student has been successful in securing scholarship funding. The high quality expectations for each incoming student has kept the enrollment in the CP to a small number of students: 1 in 1998-99, 4 in 1999-2000, 5 in 2000-01, 0 in 2001-02 and 5 anticipated in 2002-03. [Actually 6 were anticipated to start in the CP in Sept. 2002, but one of these has been offered direct entry to the PhD program. Also one of the remaining 5 has an NSERC fellowship.] It is expected that the enrollment will continue to remain at these levels in future, which is typically about ten percent of total incoming students in the two departments. It appears that significant fraction of these students (especially those admitted through the Department of Physics) have been attracted to join the U. of T. on account of the Astrophysics CP. Of the ten students who have completed the program, all have continued to the Ph.D. program [one to Cambridge University, UK and nine to the host departments at U. of T.: four in Physics and five in Astronomy and Astrophysics]. It appears that the students in the CP tend to develop a broader set of academic and social relationships among the three partners in the program than one normally sees in either of the two host departments. This has helped create an astrophysics community. Thus the CP is more about high quality students and about cross-connections between the three participating graduate units, rather than high enrollment numbers.

Recently the Department of Astronomy and Astrophysics has made a major admission policy change with the move to a direct-entry to the Ph.D. program. This may have some impact on the enrollment in the CP since many incoming students may bypass M.Sc. program in that department. The Collaborative M.Sc. in Astrophysics may then become a preferred route only for those graduate students in that department who intend to do their research in areas of astrophysics and who require a course background significantly beyond that given in most conventional undergraduate physics or related degrees. This will be particularly important in theoretical areas where the preparation to come to the forefront of modern research requires a strong background in a broad range of topics. This policy change requires a careful monitoring of the future enrollment in the CP. One possible response is that the participating units consider extending the M.Sc. CP by creating a new comprehensive CP which would include both M.Sc. and Ph.D. programs.

Recommendation 1. The participating units in the Collaborative M.Sc. Program in Astrophysics are encouraged to extend it to include a Ph.D. Collaborative program in Astrophysics.

The lecture courses that the ten graduate students took during their program, included 13 half courses from the Department of Physics, 13 half courses from the Department of Astronomy and Astrophysics and 3 half courses from the Department of Mathematics. Concerns were raised that the recent introduction of Foundation suite of courses by the Department of Physics has decreased the available appropriate choices for the CP students, who need more subject-based courses. We suggest that the program committee of the CP should regularly discuss with the departments the needs of the CP students in order that a reasonable suite of courses are available to fulfil the CP requirements. The program committee should also consider whether a course similar to G2000 in the Department of Astronomy and Astrophysics should be added to the CP requirements without increasing the total course requirements.

The Participating Faculty

There are 19 faculty members listed in the SGS calendar entry for the CP, and 7 of these supervised 10 students who completed the CP so far. The overlapping areas between the three participating units include the connections between string theory and the early time universe. There are members of the Physics faculty in this area who could form an important part of the participating faculty of the CP. We suggest that the program committee annually review and revise as appropriate the list of participating faculty. The existence of the CP has helped enhance the research of the faculty members who supervised the CP graduate students. If the CP is extended to include a Ph.D. program, this benefit to faculty will increase significantly.

Conclusion

The Collaborative M.Sc. Program in Astrophysics has made a good start in its first three years of operation through its high quality students and by significantly improving the interactions among the three participating graduate units. The introduction of the CP in 1998 has enhanced the graduate program offerings at the University of Toronto. Its extension to a PhD program is likely to enhance the faculty participation due to a higher research content.

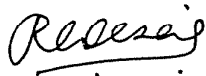
Recommendation 2. We recommend that the Collaborative M.Sc. Program in Astrophysics be continued for the next five years, 2002-2007.

Recommendations


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Recommendation 2. We recommend that the Collaborative M.Sc. Program in Astrophysics be continued for the next five years, 2002-2007.

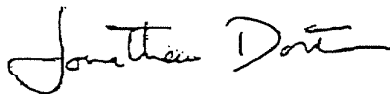
Signatures



Rashmi Desai



Ray Carlberg



Jonathan Dostrovsky



Megan McClure



Norman Murray



John Sipe