

MEMORANDUM

ATTENTION: Senate

TEL

FROM: Peter Keller, Vice-President, Academic and Provost, and Chair, SCUP



RE: External Review Mid-Cycle Report for the Department of Physics (SCUP 17-02)

DATE: January 16, 2017

TIME

At its January 11, 2017 meeting, SCUP reviewed the Mid-Cycle Report for the Department of Physics which resulted from its 2013 external review. The report is attached for the information of Senate.



OFFICE OF THE
VICE-PRESIDENT, ACADEMIC

SCUP 17-02

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MEMORANDUM

ATTENTION: Peter Keller, Chair, SCUP	TEL
FROM: Gord Myers, Vice-Provost and Associate Vice-President, Academic	
RE: External Review Mid-Cycle Report for the Department of Physics	
DATE: December 8, 2016	TIME

The External Review of the Department of Physics was undertaken in March 2013. As per the Senate guidelines, the Unit is required to submit a mid-cycle report describing its progress in implementing the External Review Action Plan. The mid-cycle report, together with a copy of the Action Plan approved by Senate, is attached for the information of SCUP.

- c: Jeff Sonier, Chair, Department of Physics
- Claire Cupples, Dean, Faculty of Science



MEMO

ATTENTION Glynn Nicholls Director, Academic Planning and Quality Assurance	TEL 778.782.6702
FROM Jeff Sonier, Chair, Department of Physics	
RE External Review Update for the Department of Physics	
DATE December 1, 2016	
TIME	

Attached please find the Mid-Cycle Report for the Department of Physics which details our progress with the Action Plan stemming from the 2013 external review.

Please feel free to contact me or my assistant, Mr. Stephen Flach if you require any additional information:
physcsec@sfu.ca.

External Review Update for the Department of Physics

Action	Progress Made
1. Programming	
1.1.1 Undergraduate	
<ul style="list-style-type: none"> □ Improve undergraduate degree completion times: <ul style="list-style-type: none"> ○ Closely examine the course schedules to facilitate taking the correct courses in the correct sequence to graduate in 4 years. If there is a problem with getting all the courses they need we can relax some of the course constraints on the various degree programs. Action item for UG curriculum committee and UG advisor. ○ Financial incentive to take more courses. We will urge the administration to provide financial incentives for students to take large course loads. The university can offer 5 courses for the price of 4 or a similar variant to encourage taking a full load. This would require upper administration initiative. Action item for the chair. ○ Require all students to meet with a program advisor. Once per year students will meet with a program advisor and show what courses they are taking, etc. They will have a form signed by their advisor or cannot register for next term/year. Action item for UG curriculum committee. ○ Implement a cohort program (reduce completion times for select students). We are currently planning 	<ul style="list-style-type: none"> ○ Reviewed curriculum for roadblocks or redundancies. Regular degrees are all close to university minimum requirements. Reduced credit requirements for all Honours degrees, only recently allowed by university; these are now all at or near university minimum. Lab courses identified as potential roadblocks, due to enrollment limits imposed by facilities. Currently reorganizing schedule and expanding lab capacity to overcome these issues. ○ Undergraduate Curriculum Committee (UGCC) Chair brought issue to Faculty-level UG committee, where other Faculty of Science Chairs were in agreement. Recommendation for lower tuition at higher course loads to be passed along to the Senate Committee on Undergraduate Studies (SCUS). ○ We are investigating mandatory advising. There is no mechanism for this currently in the student enrollment system (SIMS), and we are instead investigating adding some form of advising recommendation to students' transcripts. This item was also discussed at the Faculty-level UG committee, and we have incorporated discussions and advising with the Undergraduate Advisor into the mandatory new PHYS 201 undergraduate seminar course. ○ INSPIRE cohort has proven infeasible at this time, for lack of recruiting support and low enrollment in related cohort

<p>an honours cohort proposal through the INSPIRE initiative for very good students. They would be required to take a certain number of courses per year. Co-op terms would only be offered in the summer. If you fail a course, you leave the cohort. Students are guaranteed a department summer job placement in their first year. If successful this can serve as a model for all physics programs.</p>	<p>courses (MATH, CHEM). Despite this, we have revitalized the PHYS 125/126 enriched stream to entice interested students. Additionally, we have created PHYS 201, a two-term second-year undergraduate seminar that helps students form a cohort, provides advising, alerts students to fellowships, research and other professional opportunities. Furthermore, we continue with our Adopt-a-Physicist program, which places students in a research lab in the summer following their first year to increase their interest in Physics by exposing them to authentic Physics research environments.</p>
<ul style="list-style-type: none"> □ Increase number of physics majors through improved recruiting. In collaboration with the Dean of Science office, the department will implement a more formalized approach to recruitment. Currently recruitment is a distributed task with no clear leadership. The outreach committee, UGCC and academic advisor all play roles in recruitment. These groups should meet regularly to coordinate recruitment efforts. If funding permits the undergraduate advisor could be expanded to a full time position responsible for coordination of recruitment. The following is a list of things that should be done on a more regular and coordinated basis: <ul style="list-style-type: none"> ○ Maintain data on where our students get jobs, and make available on the web a list of potential employers. This would make our programs more attractive to students and assist senior students in targeting career searches. ○ Contact prospective incoming physics majors every year via email. This needs to be done in concert with 	<ul style="list-style-type: none"> □ The number of students enrolled in Physics programs has increased ~33% (from 150 to 200) in the past two years, which correlates with the introduction of our Discover Physics day for high school students. The Outreach Committee was renamed the Outreach and Recruitment Committee (ORC) to signify the important contributions to recruiting. The Undergraduate Advisor position changed to Undergraduate Advisor and Recruiter, to acknowledge ongoing recruiting work and extend these activities. This position serves on both UGCC and ORC to provide connection. <ul style="list-style-type: none"> ○ Careers: We have revised the career section of the Physics undergraduate website to present careers options for Physics majors. We have established a LinkedIn network to follow alumni (340 members), share relevant job postings (which receive 90-120 views from members), follow companies that hire students with physics degrees, and maintain strong ties with alumni to strengthen the undergraduate program (for instance, via invitations to interaction with current students in the PHYS 201 Undergraduate Seminar course). ○ SFU has centralized high school recruiting, making it challenging to receive information about prospective

<p>recruiting efforts at the faculty level.</p> <ul style="list-style-type: none"> ○ Continue to recruit high school students through programs such as the TRIUMF high school lecture series. ○ Liaise with university recruiting groups and contact the right students (e.g. all IB physics students in BC). ○ Attend the scholarship dinner (done on an <i>ad hoc</i> basis currently). ○ Contact alumni and gather testimonials, etc. ○ Physics membership on the Dean's recruitment committee. ○ Visit schools and/or recruit faculty members to do so (this has been done informally in the past). ○ Use the cohort program as a recruiting tool. ○ Improved IT services for recruiting (social media, website targeted to high school students.). 	<p>students prior to their enrollment and major declaration. Though the Faculty of Science no longer has a recruiting committee, the Faculty does send postcards to admitted students each year with relevant information for contacting advising.</p> <ul style="list-style-type: none"> ○ We continue to offer a number of successful outreach events, including collaborating with TRIUMF to offer five Saturday Morning Lectures at SFU Surrey each year, as well as annual Discover Physics @SFU high school recruiting events that attract ~70 students/year. <p>The Outreach Chair and Undergraduate Advisor are meeting with SFU recruiting personnel with IB connections to help target Physics-ready students.</p> <p>We have begun distributing congratulatory letters, on behalf of the Chair, at the end of the Spring and Summer terms to students who have achieved A- or better in both of their introductory Physics courses (e.g. PHYS 101/102). These letters are customized to encourage non-majors to consider Physics and to promote research and career opportunities to majors.</p>
<ul style="list-style-type: none"> □ Standardization of curriculum and delivery in first year: 	<ul style="list-style-type: none"> □ Standardization of curriculum is an ongoing process, with a particular eye toward easing the administrative and organizational burdens of instructors of 100-level courses. The process is complicated by changing curricular needs and technological changes (e.g. changing learning-management systems, homework systems, or open access textbooks). Our most important achievement in this regard is creation of a framework for archiving and disseminating course-related materials in the form of new wikis (one for internal use only and one containing course content for students, such as lab scripts).

<ul style="list-style-type: none"> ○ We have already appointed a 1st-year course coordinator to help with this for the coming fall semester. The first target is PHYS 101/102. The idea is to develop common tutorial materials and to share biology examples and demos for lectures. We will make this a permanent position, assuming resources remain available. ○ Implement a common topics list, ideally one that is shorter than the current one. ○ Develop a standardized delivery to enable us to break courses into 6-week modules, allowing faculty to share courses rather than teach it for the whole term. This also gives us more flexibility in course scheduling. ○ Incorporate standardized TA training into first year courses. ○ Get a wider group of people teaching first-year courses. ○ Ensure consistency of exams, etc. This will be facilitated 	<ul style="list-style-type: none"> ○ The 1st-year course coordinator helped create and organize a number of resources for 1st-year courses. These include common Canvas accounts for each course, instructions for the use of i-Clickers, best practices for TA training and tutorials, etc. ○ A common topics list (in the form of updated outlines) is being developed as part of establishing educational goals for courses (see next section). ○ A modular delivery of courses is not possible within SFU's current registration framework. SCUS has rejected a number of modular courses, as they do not align with the deadlines for fees, add/drop, etc. Though lobbying efforts continue, this change will not happen soon. However, we have moved to team-teaching large 1st-year courses where possible. Also, low-enrollment sections have been eliminated, and the total annual number of sections offered has been reduced by 10%. ○ Standardized TA training and an introduction to Physics Education research is incorporated into the introductory graduate course PHYS 802. All incoming graduate students are required to take PHYS 802. ○ The Department currently has 28 faculty members available for teaching. The past two years have seen 20 different faculty teaching 100-level courses (15 in classes of 100+). Two faculty, who routinely teach these courses, were unavailable because they were developing other courses, and two others are newer hires who are not yet expected to contribute at this level. ○ Grading consistency has been discussed. It is a challenging
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<p>at the first year level by the new 1st year coordinator but should be expanded to core courses in 2nd and higher years.</p> <ul style="list-style-type: none"> ○ Eliminate PHYS 130/131 and fold the lab part into a laboratorial component starting with 120/121 but extending to 101/102. 	<p>issue, due to significant statistical variations in classes of any size, as well as underlying academic freedom issues. However, we have written grading guidelines focused on preparation for subsequent courses as a guide, as well as compiling historical grade distributions and averages as guides for instructors. These resources, aided by well-defined educational goals for courses, will help ensure consistency.</p> <ul style="list-style-type: none"> ○ PHYS 131 has been eliminated in favor of a new PHYS 132/133 sequence intended to accompany PHYS 120/121 (and 125/126). Due to the diverse body of students in both the 120 and 101 sequences, it is not feasible to roll the labs into the courses and subsequently increase their credit values. However, 132/133 follow the concepts from 120/121 and are a more authentic introduction to Physics experiments, using research-based pedagogies.
<ul style="list-style-type: none"> □ Undertake a complete curriculum review. The department will undertake a complete curriculum review within the next two years. This will be carried out by the undergraduate curriculum committee in consultation with the new Strategic Planning Committee. 	<ul style="list-style-type: none"> □ This review process is ongoing, but substantial progress has been made. <ul style="list-style-type: none"> ▪ After a review of all major streams, the Honours sequences were reduced to the lowest possible credit levels, without sacrificing important content. This will increase completion time and allow schedule efficiencies. ▪ Changes to programs were made so that some low-enrollment special topics courses are no longer required, allowing flexibility in scheduling. ▪ Suggested 4-year schedules for all program streams have been updated. ▪ Program-level education goals for all program streams have been created. ▪ Course-level educational goals for each undergraduate course are ongoing. This process will also update course outlines to contain a more informative list of material covered in each course. By working on course sequences together (<i>e.g.</i> the quantum mechanics course sequence),

	redundancies and gaps in material will be identified.
<p>1.1.2 Graduate</p>	
<p><input type="checkbox"/> Recruit more scholarship eligible graduate students. The department will develop a recruiting strategy that includes: systematic improvement and maintenance of the department website, recruiting visits to potential feeder universities, recruiting through faculty research networks, and improved methods for collecting and utilizing contact information of potential recruits. The chair and the GPC chair will work with the Dean of Grad Studies office on these issues.</p>	<p><input type="checkbox"/> Substantial progress has been made on our efforts to recruit scholarship eligible graduates:</p> <ul style="list-style-type: none"> ▪ We have dramatically increased the number of scholarship eligible domestic MSc students (from 45% domestic in 2010 to 62% in 2015). Attributed to emphasis on domestic recruiting efforts. ▪ The number of NSERCs/major awards since 2013 has gone up by 8 this past year. ▪ We have used SFU's new Multi-Year Funding scholarship to recruit two international graduate students during this period. ▪ We have focused recruiting efforts on local feeder schools and conferences: CUPC, UBC, UFV, TRU, UWash, and WWU. This has resulted in a growing database of top student contacts. ▪ We have developed an updated brochure in collaboration with the Dean of Science outreach coordinator. ▪ USRA recruiting – Poster competition and combined SFU/UBC event has had positive feedback. ▪ We have improved information and routine updating of our graduate website. This includes a Prospective Students section, which provides an overview of the graduate program, and clearly outlines admission requirements, application procedures, and funding details.
<p><input type="checkbox"/> Improve degree completion times. We will implement changes to streamline our graduate programs. We have just introduced new graduate program requirements, and currently we are in the process of changing the way supervisory committees assess and report on student progress. Continued attention to recruiting will reduce completion times, by raising the overall preparation of</p>	<p><input type="checkbox"/> Several initiatives have been undertaken to reduce completion times. There is now a more thorough assessment of graduate student progress, including both research and course planning, at annual reviews. Course planning information and degree program timelines have been added to the website and are accessible to students. We have also obtained funding from SFU Graduate Studies to improve material on research skills taught in our</p>

<p>entering students.</p>	<p>mandatory PHYS 802 course (SCORE grant). There are several indicators of progress being made:</p> <ul style="list-style-type: none"> ▪ MSc completion times have gone down from an average of greater than 8 semesters from the previous review period to now under 8 semesters. ▪ There is a significant increase in the number of Physics PhDs being awarded per year compared to the last review period. ▪ There is an encouraging trend of decreased completion times for PhD students from an average of approximately 20 semesters in the previous review period to now under 18.
<p><input type="checkbox"/> Limit TA hours per semester. The External Review Committee asserts, "The reduction of the normal departmental 210 hour TA should seriously be considered." Actually, we have been considering this for some time, but we face significant barriers. The most important one is financial: If we reduce the TA load, then either student stipends must go down commensurately or other forms of support must increase to compensate. With flat or decreasing NSERC budgets, many of our faculty would find it too costly to use RA funds to compensate for a TA reduction from 210 hours to the 120-140 hours per term that many other universities assign. The only other way is to increase our scholarship budget, which we do not control. Our department has worked hard to maintain adequate student stipend levels in the face of increasing tuition, increasing cost of living, and declining federal funding for basic research, but without increased scholarship support we cannot sustain further stipend increases. We will work with the senior administration to increase the scholarship budget for research-based graduate programs, especially PhD programs.</p>	<ul style="list-style-type: none"> ▪ We have increased scholarship support where possible. MSc students now receive a Special Graduate Entrance Scholarship of \$6000 in Year 1. PhD students receive a minimum of 13,000 in scholarship support (4x\$3250 Graduate Fellowship awards) in the first four years of the PhD program. ▪ Faculty members are able to top-up partial TA loads for their students instead of the "full" load of five base units. Forms currently being used to communicate planned top-ups allow supervisors to select one through five base units per TA term; several faculty members provide top-ups on three or four base unit TAs. It is important to note that per the TSSU Collective Agreement, we cannot restrict the total base units for which a student applies to TA and we must provide a minimum of five base units (or the total base units for which the student applied if fewer than five) to Physics grad student applicants before we make offers to TAs in other categories, regardless of whether or not the supervisor is providing funding.
<p><input type="checkbox"/> Standardized training for TAs. We will implement improved training for TAs. Our new introductory graduate course devotes a few hours to TA training, and we work with TLC</p>	<p><input type="checkbox"/> TA training has improved with Physics specific TA instruction in PHYS 802. We have implemented a designated 'Head TA' for many of our first year courses to improve management of TA</p>

<p>and our first year coordinator to develop more systematic training.</p>	<p>resources.</p>
<p><input type="checkbox"/> Expand funding sources for grad support, <i>e.g.</i> CREATE. We will strive to increase graduate support through external funding sources such as CREATE. This is a long-term project, especially in the current funding climate, and will require significant administrative support through grant facilitation and support for research networking. The recent Graduate Student Research Award program was widely appreciated in our department, and we will lobby for more support of this nature.</p>	<p><input type="checkbox"/> We have not specifically pursued a CREATE grant. However, we have leveraged department funding for a new private scholarship to support Physics graduate students (<i>i.e.</i>, the Dr. Howard Malm Graduate Award in Physics) and increased awareness about available scholarships. We currently have a graduate student receiving MITACs support. Recently we were awarded a SCORE grant to fund a Physics graduate student job & networking workshop in 2017. We have also increased efforts in alumni and donor engagement (<i>e.g.</i> donor invitations to events, alumni invitation to 50th Anniversary, etc.) as a proactive step to increase awards funding, and introduced an annual graduate awards ceremony.</p>
<p>2. Research</p>	
<p><input type="checkbox"/> Rebranding. Our website and promotional materials will be “rebranded” to reduce the number of physics research themes for the purposes of recruitment and external profile. The reviewers proposed only three themes, however at our recent post-review retreat there was support for a somewhat larger number, for example (1) Materials Physics, (2) Soft Matter and Biophysics, (3) High Energy Physics and Cosmology, (4) Atomic, Molecular and Optical Physics, and (5) Theoretical Physics. We note that the Department currently lists 13 groups on its website, so that 4 or 5 will be a significant simplification. The exact formulation of the themes will be worked out by the Strategic Planning Committee in consultation with the department.</p>	<p><input type="checkbox"/> The department settled on the five research areas agreed upon at the post-review retreat. These five research themes appear on the department website, and in promotional material distributed at student recruitment events (<i>e.g.</i>, SFU Information Evening, Discover Physics, the Canadian Undergraduate Physics Conference, the Undergraduate Research Day and, and various high school and other post-secondary institution visits). A slight variation of these five research areas are showcased in newly renovated display cases across from the main office, which include touch screen displays.</p>
<p><input type="checkbox"/> Strategic Planning Committee. On the recommendation of the reviewers, the Department has formed a Strategic Planning Committee (SPC). Duties will include preparing the 5-year internal SFU planning documents and helping the Chair prepare for future external reviews and will not be</p>	<p><input type="checkbox"/> The Strategic Planning Committee (SPC) has proven valuable to developing near-term and longer-term planning in teaching, research, and recruitment. The SPC has met to develop strategies for teaching 1st-year courses, and the use of sessional instructors and Adjunct Faculty for teaching; to consider course curriculum</p>

<p>just limited to research issues. The committee will focus on both near-term and longer-term planning. The SPC will help to define long term hiring goals as well as evaluating specific opportunities as they arise. On the other hand, another 6-7, plus at least 2 lecturers will be at the retirement age in approximately 10 years, and the SPC will actively plan for that. The committee will make recommendations to the faculty at large for ratification votes.</p>	<p>issues; to investigate how to increase teaching resources; to work on course integration with other departments and institutions; to draft revisions to Adjunct/Associate Faculty member policies; to restructure outreach and recruitment efforts; and to formulate annual Physics Department hiring requests. The SPC has made recommendations from its meetings to the department faculty and has provided guidance to department committees (<i>i.e.</i>, the UGCC, GPC and ORC). The SPC has not established a hiring plan for when the next wave of faculty retires in approximately 10 years.</p>
<p><input type="checkbox"/> Postdoc recruitment. We will encourage faculty members to do outreach to PhD students at other universities when they give seminars or colloquia. Sponsoring summer schools is also a good way to increase Departmental visibility (and was done successfully in the past). The CREATE program (which also directly funds postdocs) is probably the most realistic way to generate funds for such schools. Pooling of funding for postdoc hiring is another way to increase postdoc numbers.</p>	<p><input type="checkbox"/> There has not been a strong effort by the department to recruit postdocs, as funding for postdocs continues to be challenging. Individual NSERC Discovery Grants are generally insufficient for this purpose, and hence funding must be obtained from other resources. Department faculty have been reasonably successful in this regard. There are currently 11 postdocs in the department and 26 active research faculty.</p>
<p><input type="checkbox"/> Improve industrial interactions for experimental groups. The department will increase its efforts to foster collaborations with industry through programs such as the NSERC ENGAGE and Research Partnerships programs. We will create a database of local and national companies. We will update and improve the departmental list of specialized equipment. Industries have in the past been users of such equipment, and the Department can increase such collaborations by publicizing better the facilities that we have. Improved industrial interactions will lead to increased funding for postdoctoral fellows.</p>	<p><input type="checkbox"/> Several faculty have developed collaborations with industry. Examples include NSERC Engage Grant collaborations with Automotive Fuel Cell Cooperation, Energy Aware Inc., Salon Label, and an NSERC Strategic Project Grant collaboration with Precision NanoSystems. A tour of General Fusion for interested faculty/grad students/ PDFs has been organized, and faculty have established contacts with local companies through PHYS 201. A networking event for graduate students, local company representatives, and alumni is also being planned.</p>
<p><input type="checkbox"/> Increased flexibility in teaching assignments. We propose to restructure the 1st-year courses so that a faculty member could teach 2 sections for ½ a semester. This would be particularly helpful for particle physicists and other users of</p>	<p><input type="checkbox"/> As mentioned earlier we have moved to team-teaching large 1st-year courses where possible.</p>

<p>large facilities who spend a significant fraction of their time off campus.</p>	
<p><input type="checkbox"/> Obtain lab space in 4D labs. We will lobby the administration for laboratory space in 4D LABs. Through historical accident, the Physics Department has had less presence in 4D Labs than was anticipated when it was set up. Beyond the loss of opportunities for the Department, a broad user base and support group within the University is essential for the long-term success of the facility. Towards that end, the upcoming Tier-II Appointment in Correlated Electron Materials is a natural one to be based (for laboratory facilities) within 4D Labs, and the Department will work hard to ensure that this be arranged.</p>	<p><input type="checkbox"/> The department was successful in arranging for the laboratory of newly hired Assistant Professor and Tier-II Canada Research Chair in Correlated Electron Materials to be located in 4D Labs, TASC II. However, the recent operational restructuring of 4D Labs from a Research Institute to a Core Facility negates the need to lobby the administration for more laboratory space in 4D Labs. Instead the focus has shifted to finding office space in the Physics wing of the Shrum Science Building for two Physics Department faculty currently located in 4D Labs office space.</p>
<p>3. Administration</p>	
<p><input type="checkbox"/> Formation of a strategic planning committee. As per the reviewers' suggestion, the department has formed a strategic planning committee (SPC) consisting of representatives from the various research faculty groups, as well as lecturers, and staff members. A key task of this committee will be to prioritize future hiring strategies. The SPC will be responsible for coordinating the 5 year plan as well as the external review process and as such will consider all aspects of the department's operations, not just research.</p>	<p><input type="checkbox"/> The department SPC meets annually to develop a faculty hiring plan, which is subsequently presented to the department for approval. Strategies for staff hires have instead been jointly developed by the Chair and Department Manager. The SPC has also met to modify the department's Adjunct/Associate Faculty Member Policy and to make strategy recommendations to the Undergraduate and Graduate Curriculum Committees, and the Outreach and Recruitment Committee.</p>
<p><input type="checkbox"/> More regular meetings. The department will hold more regular meetings in order to address many of the concerns of the external review committee. Meetings are now scheduled for the third Thursday of each month and will be held unless there are insufficient agenda items. In addition at least once a year a true department meeting will be held in which, faculty, and representatives from the staff and student groups will meet to discuss issues affecting the department as a whole.</p>	<p><input type="checkbox"/> We continue to have a Department Meeting involving faculty and staff typically once a month in the fall and spring semesters, but only as required in the summer semester when fewer faculty are around. An annual meeting that includes student groups has not occurred.</p>

<ul style="list-style-type: none"> □ Improved mentoring of all groups. <ul style="list-style-type: none"> ○ Improved Mentoring of Research Faculty: New research faculty will identify a faculty mentor when they are hired who will meet regularly to discuss strategies for the tenure process. This will include discussions of how to acquire research funding, effective supervision of graduate students and postdocs, responsibilities to students, and responsibilities regarding appropriate interactions with departmental staff. The chair will also meet once a semester with new faculty to ensure that they understand the expectations of the tenure process. ○ Mentoring of Lecturers. New lecturers will be matched with a mentor when they are hired who will provide advice on strategies for the review and promotion process. This will include discussions of teaching strategies, curriculum development, service duties and opportunities for professional development. The chair will also meet once a semester with new lecturers to ensure that they understand the expectations of the position. ○ Mentoring of Staff. All staff will have access to an up to date training manual. More cross training will be implemented to enable flexibility in vacation assignments. Key staff files will be available to other staff members in the case of a sudden illness during peak periods. More opportunities for professional development will be identified for staff. 	<ul style="list-style-type: none"> ○ Subsequent to the external review, all newly hired research faculty have been mentored by a senior research faculty member. Mentors provide guidance on attaining research funding, best research practices, and supervision of students and postdocs. The chair regularly communicates with new faculty the expectations for tenure and promotion in the three key areas of activity: teaching effectiveness; scholarly activity and service to the University. Contract Renewal and Tenure and Promotion procedures are now accessible to faculty members on a password-protected section of the website. ○ Implementation of mentoring for new lecturers has been postponed, as no new lecturers have been hired in the department since the external review. ○ Mentoring of Staff. <ul style="list-style-type: none"> ▪ Standard Operating Procedure pages for Office Assistant and Graduate Assistant are posted on the department's internal site. Procedures for the Chair's Assistant and Department Manager are documented but not yet available on-line. ▪ Administrative staff members are cross-trained to provide two or more levels of available backup for each administrative position, with the exception of the Manager. For the Manager position, the Financial Assistant can cover most tasks and migration to Faculty
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<ul style="list-style-type: none"> ○ Mentoring of Students. Steps will be taken to ensure that students are taking the appropriate courses for their programs. This was discussed earlier. Students also need to be mentored about career options as early as possible. This can include more training on oral presentations, written skills, writing resumes, and preparing for job interviews. We need to develop a stronger presence in the co-op program. Co-op currently provides many of these skills oriented 	<p>of Science supported systems for processes such as research payroll and teaching assistantship assignments ensure that support can be accessed from the Dean's office or other Science departments for these tasks if required.</p> <ul style="list-style-type: none"> ▪ All staff using functional computing accounts to log on to administrative computers and for all work-related email, Manager or IT support can access files as required. ▪ Administrative staff members are encouraged by the Manager to attend professional development workshops offered by University, staffers have attended workshops ranging from Microsoft Office training to project planning. ▪ Staff turnover has slowed implementation of more formal cross-training and mentorship opportunities. With two hires within the past month we now have a full staff complement in place, and will implement new initiatives, including semesterly staff meetings that will include opportunity for staff members to present a brief overview of one of the tasks they handle of which other members of the admin team may have limited knowledge. Manager will also meet formally with individual staff members on an annual basis to identify goals for professional development. <ul style="list-style-type: none"> ○ We have implemented a web-based Physics advising request form where students can obtain specific information on Physics Programs, course requirements, what courses they should be taking, and careers for someone earning a physics degree. The department website includes general course requirements for Physics majors, honours and minors programs and first-year Physics streams. It also includes a description of skills developed during our programs of study, a list of potential careers and description of potential work
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activities. Mentoring of graduate students is described above.

- **Mentoring of Department Chair and Committee Chairs.** More detailed procedure manuals need to be developed/improved for department chairs, as well as major committee chairs (UGCC, GPC). At present there are varying gaps in these documents. Work on this is under progress and is being archived on a secure website. Procedures for passing on the torch need to be more formalized through the development of detailed job manuals. The next item will also address this issue.

environments, career development and work search resources, and a SFU Physics LinkedIN profile with lots of local employers. Students are encouraged to meet with the Physics undergraduate advisor and/or Physics Program advisors to discuss any of the above.

- **Most procedural tasks overseen by chairs are coordinated by administrative assistants (see progress on documentation of administrative tasks earlier in this section).** Unfortunately, significant administrative staff leave and turnover affected the ability to develop specific procedure manuals for department and committee chairs. Even so, a number of significant steps have been taken to both standardize procedures and to make policies, procedures and general documentation accessible to the Department and committee chairs. Examples include:
 - **Development of internal Web Dav servers for the chair's office and graduate program as locations to share and archive administrative documents**
 - **The development of an extensive online procedures manual for the graduate program assistant, who coordinates the annual cycle of procedures for the graduate chair**
 - **Redesign of the graduate program website, so that graduate program policies, procedures and deadlines are centrally documented and are easily accessible by the graduate program chair, administrative staff, faculty members and students**
 - **Development of a password protected "information hub" on the Department website, where items such as committee membership, committee minutes, service positions, faculty travel and leaves, and Renewal Tenure and Promotion policies and procedures are accessible to chairs, administrative staff and faculty.**

	<ul style="list-style-type: none"> ▪ Additionally, the Department has budgeted for implementation of DocuShare content management system in the next fiscal year with a plan in place to migrate department policy documentation to the system to provide ease of reference for chairs.
<input type="checkbox"/> Improve documentation and training procedures. We will continue to develop training manuals and up to date job descriptions for all administrative staff. We are also moving to an online line archive of departmental policies and procedures which should make it easier for future chairs.	<input type="checkbox"/> See notes on documentation of administrative procedures, above. All administrative job descriptions have been updated since the last external review. On-line department policy archive requires development; we have not had the staff resources available to devote to this project.
<input type="checkbox"/> Improved collegiality. We will move to improve social interactions in the department. Suggestions for improvements include, regular coffee breaks on a fixed day of the week where staff, students and faculty can meet to chat, a summer barbeque open to all department members (offered this summer), regular departmental receptions for physics alumni at convocation (done for the first time this summer), more departmental sports activities (like the annual softball series, etc.).	<input type="checkbox"/> All suggestions for social opportunities have been implemented.
<input type="checkbox"/> Increased financial administrative support. There has been a significant increase in workload due to the policies for assigning TA stipends in recent years as well as a general downloading of clerical duties to department staff (and faculty). We will work with the Dean to secure an increase in the staff support for financial administration.	<input type="checkbox"/> Administrative job descriptions have been updated to provide full-time financial assistant support. New procedures have been implemented and new systems adopted for TA assignment and payroll processes which have simplified administration in these areas.
4. Working Environment	
<input type="checkbox"/> Urgent building upgrades/repairs. We will continue to press the administration for urgently needed repairs and code compliant modifications to the physics building. These should be pursued in the short term with funding from outside the department operating budget. Examples include: <ul style="list-style-type: none"> ○ Urgent seismic upgrades to the department physics 	<ul style="list-style-type: none"> ○ Seismic upgrades to physics office have not been completed.

<p>office (2 story unreinforced concrete block walls).</p> <ul style="list-style-type: none"> ○ Urgent modifications to office space for technical staff. Currently two of our teaching staff occupy storage hallways with inadequate fire egress. ○ Modifications to first year physics labs to permit larger numbers of students and flexibility in lab offerings as well as solving item (2) above. ○ Various modifications to the physics office (some are now underway, e.g. sliding security door). ○ Fix water infiltration problems throughout the department. 	<p>Staff workstations have been moved away from area directly underneath unreinforced walls.</p> <ul style="list-style-type: none"> ○ We still lack appropriate office space for technical staff. In general, the Department has a critical shortage of office space for faculty, students, research personnel and staff. ○ The first year physics labs have been substantially renovated, as previously mentioned. The current layout of the lab accommodates more students in a modernized teaching laboratory. ○ To create new workspace for our Financial Assistant, we have divided the former Manager's office in two. Further front office renovations have included the removal of excess cabinetry and filing cabinets to provide better workstation layout for Graduate and Office Assistants, and the installation of a new security gate to provide increased security. ○ Significant plumbing upgrades, including the replacement of water pipes and hot water tanks, have been completed in the Physics building.
<ul style="list-style-type: none"> □ Improved transparency of the renovation resources allocation. We will continue to press the administration for a more transparent process for allocation of renovation resources. Renovations requests should be solicited from all departments and adjudicated in a transparent fashion. 	<ul style="list-style-type: none"> □ Major renovation needs continue to be brought to the attention of the Dean of Science Office through which funding resources are sought. The renovation requests of recent faculty hires have been satisfied in this way. However, renovation resources are scarce and to some extent are being applied where the need is most critical.
<ul style="list-style-type: none"> □ Increased operating budgets to cover continual building repairs items. We will urge the administration to take into consideration the increased operating costs of departments like physics and biology compared with recently updated facilities like chemistry, MBB, and TASC II (primarily chemistry). Physics is expected to fund a large number of small renovations (\$5k or less) and upgrades out of limited 	<ul style="list-style-type: none"> □ We have no control over building maintenance budgets. The chair regularly lobbies the Dean's office for consideration with regard to expenses incurred through operating a department in a deteriorating building.

<p>operating funds. These expenses occur as a result of the deteriorating condition of the building. As a result the state of the building grows worse each year due to deferred maintenance.</p>	
<p><input type="checkbox"/> Allocate some 4D LAB space to physics researchers. We will continue to press the administration for access to research lab space in 4D LABS. We completely support the reviewer's suggestions that some space in 4D LABS/TASC II be assigned to the physics department. We urge the administration to conduct an audit of space per experimental research faculty in the primary experimental research departments (physics, chemistry, life sciences) in order to make the case for some redistribution of quality lab space.</p>	<p><input type="checkbox"/> 4D LABS has undergone an operational restructuring from a Research Institute to a Core Facility, and the new governance model has only recently begun to take effect. Going forward decisions regarding the faculty labs on the 7000 level (TASC2 7010 through 7150) will now be made following significant consultation with the appropriate Departmental Chairs and Faculty Deans and approval of Vice-President, Academic and Provost.</p>
<p>5. Outreach</p>	
<p><input type="checkbox"/> Improve research faculty participation in outreach.</p>	<p><input type="checkbox"/> The department has been encouraging research faculty to participate in outreach. As a result, a new faculty member has joined the Physics Outreach & Recruitment Committee. Now there are 3 research faculty members on the committee. In addition, significantly more research faculty members in the department have been involved in outreach and recruitment activities, including lab tours, information sessions, research talks, workshops, public lectures, etc.</p>
<p><input type="checkbox"/> Increase involvement of HQP by rewarding them for attendance.</p>	<p><input type="checkbox"/> Participation in outreach is recognized as service work for the evaluation of job performance of faculty members. More staff, postdocs and graduate students have been involved in outreach and recruitment activities. Many postdocs and graduate students find the experience they gain in outreach activities valuable, especially those who are interested in a teaching career. We keep records of volunteers who have participated in outreach/recruitment events, which enables the faculty on the outreach committee to mention this service in reference letters requested by students and postdocs who are applying for jobs.</p>
<p><input type="checkbox"/> Improved web presence for recruitment and outreach</p>	<p><input type="checkbox"/> We have been constantly updating the outreach and recruitment</p>

<p>(website, social media).</p>	<p>information on the SFU Physics website. We also advertise our outreach/recruitment events through various channels online and via social media such as Facebook and Twitter. As a result, most of our outreach/recruitment events in recent years have been at full capacity.</p> <ul style="list-style-type: none"> <input type="checkbox"/> We have also been building a network using LinkedIn for recruitment and outreach purposes. At present about 30% of the department's undergraduate alumni are on the network, and the number is growing. The main idea is to show what kind of jobs our students can get with a physics degree. Also, it has the potential to draw donations.
<ul style="list-style-type: none"> <input type="checkbox"/> Work with the Dean of Science and other departments to avoid duplication in the area of outreach activities. 	<ul style="list-style-type: none"> <input type="checkbox"/> After discussions with outreach staff in the Dean of Science office as well as within the Physics Outreach & Recruitment Committee, we have decided on priorities for our outreach and recruitment efforts. As a result, we have removed outreach activities that are not well focused or possibly redundant.



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MEMORANDUM

ATTENTION	Jeff Sonier Chair, Department of Physics	DATE	October 20, 2016
FROM	Glynn Nicholls Director, Academic Planning and Quality Assurance	PAGES	1
COPY	Claire Cupples Dean, Faculty of Science		
RE:	External Review Update for the Department of Physics		

As per Senate guidelines, the Department of Physics is to report on progress being made in the implementation of the Action Plan that resulted from its external review in March 2013. This report will be presented to SCUP and Senate for information. The Chair will be asked to attend the SCUP meeting to provide comment and answer any questions about the update on the Action Plan. The Dean may choose to attend the meeting at her discretion.

Please submit your progress report, using the attached template, by Thursday, December 1, 2016 to Bal Basi at bbasi@sfu.ca. Also attached, for ease of reference, is the Action Plan that was approved by Senate on March 3, 2014.

Although your external review took place prior to the requirement to develop educational goals and assessment beginning with the 2013-14 external review cycle, any progress being made in your Department in defining program and/or course level educational goals for academic programs would be welcome in your progress report.

Please contact me at 2-6702, glynn_nicholls@sfu.ca, or Bal Basi at 2-7676, bbasi@sfu.ca, if you have any questions or concerns regarding the external review update process.

Attach.

EXTERNAL REVIEW – ACTION PLAN

Section 1 – To be completed by the Responsible Unit Person e.g. Chair or Director

Unit under review Physics	Date of Review Site visit March 6-8, 2013	Responsible Unit person, Simon Watkins	Faculty Dean Claire Cupples
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*Note: It is **not** expected that every recommendation made by the Review Team be covered by this Action Plan. The major thrusts of the Report should be identified and some consolidation of the recommendations may be possible while other recommendations of lesser importance may be excluded.*

Should an additional response be warranted, it should be attached as a separate document.

1. PROGRAMMING

1.1 Action/s (description what is going to be done):

1.1.1 Undergraduate programming:

- **Improve undergraduate degree completion times:** Below are some proposed action items:
 - **Closely examine the course schedules** to facilitate taking the correct courses in the correct sequence to graduate in 4 years. If there is a problem with getting all the courses they need, we can relax some of the course constraints on the various degree programs. Action item for UG curriculum committee and UG advisor.
 - **Financial incentive to take more courses.** We will urge the administration to provide financial incentives for students to take large course loads. The university can offer 5 courses for the price of 4 or a similar variant to encourage taking a full load. This would require upper administration initiative. Action item for the chair.
 - **Require all students to meet with a program advisor:** Once per year students will meet with a program advisor and show what courses they are taking, etc. They will have a form signed by their advisor or cannot register for next term/year. Action item for UG curriculum committee.
 - **Implement a cohort program (reduce completion times for select students):** We are currently planning an honours cohort proposal through the INSPIRE initiative for very good students. They would be required to take a certain number of courses per year. Co-op terms would only be offered in the summer. If you fail a course, you leave the cohort. Students are guaranteed a department summer job placement in their first year. If successful this can serve as a model for all physics programs.
- **Increase number of physics majors through improved recruiting:** In collaboration with the Dean of Science office, the department will implement a more formalized approach to recruitment. Currently recruitment is a distributed task with no clear leadership. The outreach committee, UGCC and academic advisor all play roles in recruitment. These groups should meet regularly

to coordinate recruitment efforts. If funding permits the undergraduate advisor could be expanded to a full time position responsible for coordination of recruitment. The following is a list of things that should be done on a more regular and coordinated basis:

- Maintain data on where our students get jobs, and make available on the web a list of potential employers. This would make our programs more attractive to students and assist senior students in targeting career searches.
 - Contact prospective incoming physics majors every year via email. This needs to be done in concert with recruiting efforts at the faculty level.
 - Continue to recruit high school students through programs such as the TRIUMF high school lecture series.
 - Liaise with university recruiting groups and contact the right students (e.g. all IB physics students in BC)
 - Attend the scholarship dinner (done on an *ad hoc* basis currently).
 - Contact alumni and gather testimonials, etc.
 - Physics membership on the Dean's recruitment committee.
 - Visit schools and/or recruit faculty members to do so (this has been done informally in the past).
 - Use the cohort program as a recruiting tool.
 - Improved IT services for recruiting (social media, website targeted to high school students...)
- **Standardization of curriculum and delivery in first year:**
 - We have already appointed a 1st-year course coordinator to help with this for the coming fall semester. The first target is PHYS 101/102. The idea is to develop common tutorial materials and to share biology examples and demos for lectures. We will make this a permanent position, assuming resources remain available.
 - Implement a common topics list, ideally one that is shorter than the current one.
 - Develop a standardized delivery to enable us to break courses into 6-week modules, allowing faculty to share courses rather than teach it for the whole term. This also gives us more flexibility in course scheduling.
 - Incorporate standardized TA training into first year courses.
 - Get a wider group of people teaching first-year courses.
 - Ensure consistency of exams, etc. This will be facilitated at the first year level by the new 1st year coordinator but should be expanded to core courses in 2nd and higher years.
 - Eliminate PHYS 130/131 and fold the lab part into a laboratorial component starting with 120/121 but extending to 101/102.
- **Undertake a complete curriculum review:** The department will undertake a complete curriculum review within the next two years. This will be carried out by the undergraduate curriculum committee in consultation with the new Strategic Planning Committee.

Resource implications:

Our suggestion to offer 5 courses for the price of 4 can be done in a revenue neutral way, but would have to have support from the highest levels of the administration. The development of a dedicated recruitment position in the department of physics would require additional resources or elimination of current ones. Our preferred choice would be the conversion an existing ½ time position such as advisor to a full time position with recruitment as an additional task. Central recruitment support through the Dean of Science office would also be needed.

1.1.2 Graduate Programming:

- **Recruit more scholarship eligible graduate students:** The department will develop a recruiting strategy that includes: systematic improvement and maintenance of the department website, recruiting visits to potential feeder universities, recruiting through faculty research networks, and improved methods for collecting and utilizing contact information of potential recruits. The chair and the GPC chair will work with the Dean of Grad studies office on these issues.
- **Improve degree completion times:** We will implement changes to streamline our graduate programs. We have just introduced new graduate program requirements, and currently we are in the process of changing the way supervisory committees assess and report on student progress. Continued attention to recruiting will reduce completion times, by raising the overall preparation of entering students.
- **Limit TA hours per semester:** The External Review Committee asserts, "The reduction of the normal departmental 210 hour TA should seriously be considered." Actually, we have been considering this for some time, but we face significant barriers. The most important one is financial: if we reduce the TA load, then either student stipends must go down commensurately or other forms of support must increase to compensate. With flat or decreasing NSERC budgets, many of our faculty would find it too costly to use RA funds to compensate for a TA reduction from 210 hours to the 120-140 hours per term that many other universities assign. The only other way is to increase our scholarship budget, which we do not control. Our department has worked hard to maintain adequate student stipend levels in the face of increasing tuition, increasing cost of living, and declining federal funding for basic research, but without increased scholarship support we cannot sustain further stipend increases. We will work with the senior administration to increase the scholarship budget for research-based graduate programs, especially PhD programs.
- **Standardized training for TAs:** We will implement improved training for TAs . Our new introductory graduate course devotes a few hours to TA training, and we work with TLC and our first year coordinator to develop more systematic training.
- **Expand funding sources for grad support, e.g. CREATE:** We will strive to increase graduate support through external funding sources such as CREATE. This is a long-term project, especially in the current funding climate, and will require significant administrative support through grant facilitation and support for research networking. The recent Graduate Student Research Award program was widely appreciated in our department, and we will lobby for more support of this nature.

Resource implications (if any):

Closer collaboration between dean's office and department for recruitment. Travel funds for recruitment and prospective graduate student visits to SFU. Increased scholarship budget for research-based graduate programs, especially PhD programs.

1.3 Expected completion date/s:

Most of these items will require ongoing attention throughout the coming review period, although it should be possible to initiate several of them by the end of 2014: improve recruiting and streamline admissions, consolidate changes to program requirements and supervisory committee assessments, standardize TA training.

2. RESEARCH

2.1 Action/s (what is going to be done):

- **Rebranding:** Our website and promotional materials will be "rebranded" to reduce the number of physics research themes for the purposes of recruitment and external profile. The reviewers proposed only three themes, however at our recent post-review retreat there was support for a somewhat larger number, for example (1) Materials Physics, (2) Soft Matter and Biophysics (3) High Energy Physics and Cosmology (4) Atomic, Molecular and Optical Physics, and (5) Theoretical Physics. We note that the Department currently lists 13 groups on its website, so that 4 or 5 will be a significant simplification. The exact formulation of the themes will be worked out by the Strategic Planning Committee in consultation with the department.
- **Strategic Planning Committee:** On the recommendation of the reviewers the Department has formed a Strategic Planning Committee (SPC). Duties will include preparing the 5-year internal SFU planning documents and helping the Chair prepare for future external reviews and will not be just limited to research issues. The committee will focus on both near-term and longer-term planning. The SPC will help to define long term hiring goals as well as evaluating specific opportunities as they arise. On the other hand, another 6-7, plus at least 2 lecturers will be at the retirement age in approximately 10 years, and the SPC will actively plan for

that. The committee will make recommendations to the faculty at large for ratification votes.

- **Postdoc recruitment:** We will encourage faculty members to do outreach to PhD students at other universities when they give seminars or colloquia. Sponsoring summer schools is also a good way to increase Departmental visibility (and was done successfully in the past). The CREATE program (which also directly funds postdocs) is probably the most realistic way to generate funds for such schools. Pooling of funding for postdoc hiring is another way to increase postdoc numbers.
- **Improve industrial interactions for experimental groups:** The department will increase its efforts to foster collaborations with industry through programs such as the NSERC ENGAGE and Research Partnerships programs. We will create a database of local and national companies. We will update and improve the departmental list of specialized equipment. Industries have in the past been users of such equipment, and the Department can increase such collaborations by publicizing better the facilities that we have. Improved industrial interactions will lead to increased funding for postdoctoral fellows.
- **Increased flexibility in teaching assignments:** We propose to restructure the 1st-year courses so that a faculty member could teach 2 sections for ½ a semester. This would be particularly helpful for particle physicists and other users of large facilities who spend a significant fraction of their time off campus.
- **Obtain lab space in 4D labs:** We will lobby the administration for laboratory space in 4D LABs. Through historical accident, the Physics Department has had less presence in 4D Labs than was anticipated when it was set up. Beyond the loss of opportunities for the Department, a broad user base and support group within the University is essential for the long-term success of the facility. Towards that end, the upcoming Tier-II Appointment in Correlated Electron Materials is a natural one to be based (for laboratory facilities) within 4D Labs, and the Department will work hard to ensure that this be arranged.

2.2 Resource implications (if any):

Securing space in 4D LABS will have some costs especially if some existing faculty need to be relocated to more appropriate facilities however the overall cost should be lower as there will be less need for expensive renovations in the aging Physics building.

2.3 Expected completion date/s:

Formation of a Strategic Planning committee occurred in July 2013. The rebranding initiatives can be rolled out over the next year. We hope to resolve the 4D LABS situation in the next few months given the time constraints of our pending hire in Correlated Electron Materials.

3. ADMINISTRATION

3.1 Action/s(what is going to be done) :

- **Formation of a strategic planning committee:** As per the reviewers suggestion, the department has formed a strategic planning committee (SPC) consisting of representatives from the various research faculty groups, as well as lecturers, and staff members. A key task of this committee will be to prioritize future hiring strategies. The SPC will be responsible for coordinating the 5 year plan as well as the external review process and as such will consider all aspects of the department's operations, not just research.
- **More regular meetings:** The department will hold more regular meetings in order to address many of the concerns of the external review committee. Meetings are now scheduled for the third Thursday of each month and will be held unless there are insufficient agenda items. In addition at least once a year a true department meeting will be held in which, faculty, and representatives from the staff and student groups will meet to discuss issues affecting the department as a whole.
- **Improved mentoring of all groups:** Specific actions to improve mentoring of all department personnel are listed below:
 - **Improved Mentoring of Research Faculty:** New research faculty will identify a faculty mentor when they are hired who will meet regularly to discuss strategies for the tenure process. This will include discussions of how to acquire research funding, effective supervision of graduate students and postdocs, responsibilities to students, and responsibilities regarding appropriate interactions with departmental staff. The chair will also meet once a semester with new faculty to ensure that they understand the expectations of the tenure process.
 - **Mentoring of Lecturers:** New lecturers will be matched with a mentor when they are hired who will provide advice on strategies for the review and promotion process. This will include discussions of teaching strategies, curriculum development, service duties and opportunities for professional development. The chair will also meet once a semester with new lecturers to ensure that they understand the expectations of the position.
 - **Mentoring of Staff:** All staff will have access to an up to date training manual. More cross training will be implemented to enable flexibility in vacation assignments. Key staff files will be available to other staff members in the case of a sudden illness during peak periods. More opportunities for professional development will be identified for staff.
 - **Mentoring of Students:** Steps will be taken to ensure that students are taking the appropriate courses for their programs. This was discussed earlier. Students also need to be mentored about career options as early as possible. This can include more training on oral presentations, written skills, writing resumes, and preparing for job interviews. We need to develop a stronger presence in the coop program. Coop currently provides many of these skills oriented activities. Mentoring of graduate students is described above.
 - **Mentoring of department chair and committee chairs:** More detailed procedure manuals need to be developed/improved for department chairs, as well as major committee chairs (UGCC, GPC). At present there are varying gaps in these documents. Work on this is under progress and is being archived on a secure website. Procedures for passing on the torch need to be more formalized through the development of detailed job manuals. The next item will also address this issue.

- **Improve documentation and training procedures:** We will continue to develop training manuals and up to date job descriptions for all administrative staff. We are also moving to an online line archive of departmental policies and procedures which should make it easier for future chairs.
- **Improved collegiality:** We will move to improve social interactions in the department. Suggestions for improvements include, regular coffee breaks on a fixed day of the week where staff students and faculty can meet to chat, a summer barbeque open to all department members (offered this summer), regular departmental receptions for physics alumni at convocation (done for the first time this summer), more departmental sports activities (like the annual softball series etc.).
- **Increased financial administrative support:** There has been a significant increase in workload due to the policies for assigning TA stipends in recent years as well as a general downloading of clerical duties to department staff (and faculty). We will work with the Dean to secure an increase in the staff support for financial administration.

3.2 Resource implications(if any):

The creation of an additional ½ time financial services position or centralized support from the Dean of Science office. Minor increase in expenses for departmental activities to promote collegiality. An additional teaching relief for an associate chair should the department decide to go that route.

3.3 Expected completion date/s:

The Strategic Planning Committee was formed in July 2013, and should begin making recommendations in consultation with the department by early fall 2013. The on-line policies and procedures archive should be essentially completed by the end of the current chair's term (fall of 2014).

4. WORKING ENVIRONMENT

4.1 Action/s(what is going to be done) :

- **Urgent building upgrades/repairs:** We will continue to press the administration for urgently needed repairs and code compliant modifications to the physics building. These should be pursued in the short term with funding from outside the department operating budget. Examples include:
 - Urgent seismic upgrades to the department physics office (2 story unreinforced concrete block walls).
 - Urgent modifications to office space for technical staff. Currently two of our teaching staff occupy storage hallways with inadequate fire egress.
 - Modifications to first year physics labs to permit larger numbers of students and flexibility in lab offerings as well as solving

item (2) above.

- Various modifications to the physics office (some are now underway e.g. sliding security door)
- Fix water infiltration problems throughout the department.
- **Improved transparency of the renovation resources allocation:** We will continue to press the administration for a more transparent process for allocation of renovation resources. Renovations requests should be solicited from all departments and adjudicated in a transparent fashion.
- **Increased operating budgets to cover continual building repairs items:** We will urge the administration to take into consideration the increased operating costs of departments like physics and biology compared with recently updated facilities like chemistry, MBB, and TASC II (primarily chemistry). Physics is expected to fund a large number of small renovations (\$5k or less) and upgrades out of limited operating funds. These expenses occur as a result of the deteriorating condition of the building. As a result the state of the building grows worse each year due to deferred maintenance.
- **Allocate some 4D LAB space to physics researchers:** We will continue to press the administration for access to research lab space in 4D LABS. We completely support the reviewer's suggestions that some space in 4D LABS/TASCII be assigned to the physics department. We urge the administration to conduct an audit of space per experimental research faculty in the primary experimental research departments (physics, chemistry, life sciences) in order to make the case for some redistribution of quality lab space.

4.2 Resource implications(if any):

These modifications will not be cheap but given the fact that a full renovation of the department similar to the recent chemistry renovation is probably at least a decade off, it is no longer an option to defer urgent physical deficiencies. The total cost of these temporary modifications will probably amount to the order of one million dollars spread over a 5 year period. This needs to be placed in the context of a recent million plus dollar renovation of teaching lab space in the department of chemistry which was funded out of university operating funds. We are currently working with facilities to establish estimates for the physics office upgrades. The proposed modifications to the first year lab will be significantly higher. We do not know the cost of fixing the chronic water infiltration problems in our department, but given the long time to renovation of the department this should be an urgent priority. Many parts of the department exhibit a third world appearance that is bad for internal morale and bad for our external image, to say nothing of health and safety issues.

4.3 Expected completion date/s:

The seismic upgrades need to be completed no later than summer 2014. Teaching staff offices can be achieved when the first year office space is completed, hopefully by fall of 2014.

5. Outreach (OTHER)

5.1 Action/s:

While Physics Outreach efforts were strongly praised by the external review committee. There is room for improvement. As a whole the department will strive to:

- Improve research faculty participation in outreach
- Increase involvement of HQP by rewarding them for attendance.
- Improved web presence for recruitment and outreach (website, social media)
- Work with the Dean of Science and other departments to avoid duplication in the area of outreach activities

5.2 Resource Implications(if any):

As a part of the new outreach center and observatory there needs to be a dedicated staff person who would liaise with the individual departments. This will need to be done at the Faculty level.

5.3 Expected completion date/s:

The goals outlined here can be rolled out over the next three years.

The above action plan has been considered by the Unit under review and has been discussed and agreed to by the Dean.

Unit Leader (signed)		Date
Name <u>S. Watin</u>	Title <u>Department Chair</u>	<u>5 Nov 2013</u>

Section 2 - Dean's comments and endorsement of the Action Plan:

The External Review of the Department of Physics is largely favourable. The reviewers do a solid job of identifying departmental strengths and weaknesses, and have made constructive recommendations for improvement. The Department's response shows that they have given considerable thought to these recommendations; my only concern is that they may have been overly ambitious and too prescriptive in their action plan. Thus, in the paragraphs that follow, I highlight the main issues that reviewers and department have identified and suggest ways that the Faculty can work with the department to resolve them.

Concern about time to degree completion for both undergraduate and graduate students is a recurring theme in departmental appraisals in the Faculty of Science. Thus, while Physics can and should take steps internally towards addressing the problems, such as curriculum reform, better student advising, improved course scheduling, website enhancements, etc., Faculty of Science funds would be better invested in solutions that are not specific to just one department. Degree completion times have also been the subject of recent discussion at the presidential and VP's level, so we can expect university-wide initiatives in the near future.

The Faculty of Science has recently started a variety of new initiatives to coordinate student advising, alumni engagement, student recruitment (both graduate and undergraduate), IT, and outreach, building on best practices among the eight departments. There are significant cost and time efficiencies to this approach. Physics, as with all departments, will be a vital part of this process. In consultation with all department chairs and managers, we are in the process of altering our budget processes for reporting and administering operating budgets. With advice from individual faculty members, we are starting to provide the same types of services to researchers.

Development of a cohort program to attract top science students, an initiative led by members of the Physics Department, is well underway and is being supported with financial and personnel resources from the Dean's Office as part of the INSPIRE initiative. The Faculty has given approval in principle to a pilot, and has committed to raising funds from donors for research experiences for 1st year students, since they are ineligible for NSERC and VPR research funds.

There is no doubt that the quality of space in the Physics Department is substandard, and that this situation has a detrimental effect on staff and faculty morale, student recruitment, teaching, research, and faculty recruitment. The Faculty of Science has put some funds into upgrading some minor problems (e.g. ventilation and office security), but the financial scope of the problems exceeds our budget by orders of magnitude. In addition, we are reluctant to do extensive, expensive renovations of individual labs only to have those renovations destroyed when the hoped-for department-wide reconstruction occurs. Physics makes the specific case that assignment of space in the 4D LABS to Physics would mitigate some of their problems. However, that can only occur at the expense of other departments. My staff is

currently working with leaders in Physics, Chemistry and the 4D LABS Research Institute to develop a comprehensive space plan that is advantageous to all faculty and staff working in the field of materials science.

The Physics Department is highly collegial, and I believe that faculty and staff within the department will do an excellent job of tackling the major projects of curriculum review and strategic planning (particularly around faculty recruitment) recommended by the External Reviewers. However, to avoid burn-out and costly duplication of effort, I urge them to work with the Faculty of Science and their fellow departments to solve the issues that are common to all.

Faculty Dean ... <i>Claire Cupples</i>	Date ...5 Nov 2013.....
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