Department of Physics and Physical Oceanography

Response and Action Plan

June 30, 2016

Response and Action Plan of the Department Physics and Physical Oceanography, Memorial University to the Report of the Academic Unit Planning Review Panel

Introduction

As part of the Academic Unit Planning, a Review Panel consisting of **Dr. Colin Farquharson** (Department of Earth Sciences, Memorial University)**, Dr. Yves Gratton** (Centre eau, terre et environnement Institut National de la Recherche Scientifique), **Dr. Marco Merkli** (Chair) (Department of Mathematics and Statistics, Memorial University) and **Dr. Andrew Rutenberg** (Department of Physics and Atmospheric Science, Dalhousie University) visited the Department of Physics and Physical Oceanography for three days (Feb. 11-13, 2016). During their visit the panel members met with faculty, staff, and students as well as senior University Administrators.

Following their visit the review panel submitted their report to the Dr. Mark Abrahams, Dean of Faculty Science in March 2016. Based on the Self-Study Report, Academic Programme Review submitted to the Review Panel in November 2015 and the interviews carried out during their site visit, the panel members identified four core areas of focus for the Physics and Physical Oceanography Department. They are: Space, Undergraduate Teaching, Student Recruitment, and Strategic Plan.

The overall impressions of the Review Panel members have been positive. They indicated that members of the department are “collegial, engaged and hard-working.” They indicated that our teaching at both undergraduate and graduate levels is extensive and “laudable”. They pointed out that we have large number of (mostly international) graduate students. They also noted that changes at the departmental and university levels as well as at the provincial and federal levels will necessitate corresponding changes in the department. They strongly urge us to plan ahead for the coming changes by being prepared, for example by having a well thought-out departmental Strategic Plan.

In total they made 11 recommendations related to departmental activities. In this document we will respond to these recommendations and propose actions to remedy some of the shortcoming as observed by the panel members.

List of Recommendations

1. Four Focus areas

1.1 Space

Recommendation 1. A departmental space committee should identify space needs and solutions, coordinated with strategic goals of the Department (i.e. hiring plans). This committee should:

1A. Plan to minimize the disruption of research and teaching activity during building renovation. Individual plans should be made for each experimental (and teaching) laboratory, and financial arrangements made to implement them (at the Dean's level). Ideally, a way to only move labs once during renovations should be found.

Response to 1A.: The plans for the reallocation/renovation of the Physics/Chemistry Building remain quite uncertain. It is anticipated that the Core Science Building will not be ready to move in till 2019 (the projected completion is the last quarter of 2019). The current provincial budgetary constrains also add to the uncertainty of whether or not the Physics/Chemistry Building will be renovated and if so how extensively. The whole operation will be quite complex because it will involve moving of a number of departments in the Faculty of Science and will require extensive coordination. It is hoped that within the next couple of years or sooner a plan will emerge and the department will have a clearer idea of what will be involved in the building reallocation/renovation. In the meantime, the department is in the process of producing Strategic Plan that should aid in the planning of this moving/renovation activity.

Action: With the help of the departmental space committee, the department is identifying the space needs of the individual faculty members' research and for teaching our courses. These space requirements (including those for the future faculty hires) will be listed in the Strategic Plan for the department that is currently being written.

Responsibility: Senior University Managers, Dean of Science and Head of Department

1B. Plan to smoothly function after the renovations, in particular to minimize the impacts of divided experimental labs between buildings, and cryogen supplies. Again, these plans should be made lab by lab and should be budgeted at the Dean's level.

Response to 1B.: see the response to 1A. This recommendation is closely tied with the recommendation 1A and is contingent on the proposed moving of other departments and possible renovation (changes) of the Physics/Chemistry Building.

Action: The department, through the space committee will work closely with the Dean on producing a plan for individual research's labs to get back to full operation after the renovations (if they are carried out).

Responsibility: Senior University Managers, Dean of Science and Head of Department

1C. As renovation and building plans firm up, the departmental space committee should regularly discuss space needs and concerns with the Dean of Science.

Response to 1C.: The department, through the space committee, will consult with the Dean of Science on regular basis regarding our space needs.

Action: The head after consulting with the space committee and the department as a whole will meet with the Dean as often as is required to address the space issues.

Responsibility: Head of Department

1D. Find coherent office space for graduate theory students, in order to provide stronger informal cross-training and community building.

Response to 1D.: The department views this recommendation as highly desirable and will take the opportunity to request this space when the plan for the reallocation/renovations is being discussed.

Action: The head and the space committee will insure that this item is part of the plan for the future changes in Physics/Chemistry Building. The chair of the space committee is gathering space information regarding space needs for the whole department. The assignment of graduate students space will be considered and we will endeavour to give our all of our graduate theory students space on the third floor of the Physics/Chemistry Building.

Responsibility: Head of Department

1.2 Undergraduate Teaching

Recommendation 2. The Department should reform the undergraduate curriculum. We suggest the following:

2A. Because the healthy service component of most physics courses in lower years dilutes the community of physics students in those classes, and because the first year classes are split due to the lack of large classrooms, a "streamed" approach could be implemented starting in the first year. One course in every year could be aimed at the level and interests of physics-honours students.

Response to 2A.: The department, through an ad hoc subcommittee of the undergraduate studies committee, gave this option careful consideration.

Action: The ad hoc subcommittee and the undergraduate studies committee after careful deliberation concluded that for various reasons this option of "streamed" course for interested physics-honours bound students is not possible at this time, however this may be revisited in the future. In the meantime, meetings with first-year instructors are planned for beginning of every semester with the Academic Program Officer and head of the Undergraduate Studies Committee to review advising students on the first day of class. The goal is to help students with both strong and weak physics backgrounds decide the best first-year program to meet their needs.

Responsibility: Head of Department

2B. Remove, merge, or reform individual courses that impede growth of the physics honours programme.

Response to 2B.: The department, through the undergraduate studies committee, is currently undertaken a review of all of its undergraduate courses.

Action: The head requested that the chair of the undergraduate committee be granted a teaching remission to supervise this extensive undergraduate course review. On the head's recommendation, the Dean appointed Dr. Martin Plumer as a Special Advisor to the Head to oversee and coordinate this review. This review process started in September 2015 will continue until it is completed.

Responsibility: Head of Department

2C. Develop new courses that could reflect and highlight exciting areas of physics, aligned with faculty interests, to attract and retain physics students in upper years.

Response to 2C.: The department will continue to introduce new courses.

Action: Last year (2015/16) the department (in collaboration with Department of Mathematics and Statistics) proposed a new course Physics 4852, Quantum Information and Computing which is scheduled to be taught in the 2016/17 academic year. Other novel courses will be introduced as is needed and/or when the resources to offer these courses are available, for example, as part of the new programme proposals such computational physics, ocean physics and others.

Responsibility: Head of Department

2D. Tweak existing programmes and streams to increase the stability of course offerings, so that faculty can generally expect stable course assignments. Course turnover should have a target of, e.g., every five years. This will allow faculty to invest more effort in course and material development and delivery, and should improve the quality of and engagement with existing courses.

Response to 2D.: The head of the department agrees that it is a desirable thing to give faculty stable course assignment say over a period of five years or so. This is not always possible due to various leaves and other unexpected events.

Action: The head will endeavor to minimize course turn over within the constraints of the departmental teaching needs.

Responsibility: Head of Department

2E. Proceed with the creation of the Computational Physics and Ocean Physics programmes. These reflect current strengths and interests of the Department.

Response to 2E.: The department, through the undergraduate studies committee, will formulate the proposals for the Computation Physics and Ocean Physics programmes.

Action: Dr. Plumer in his capacity as a Special Advisor to the Head will coordinate this activity in the Fall 2016. It is hoped that these programmes will be available to students in the next academic year (2017/18).

Responsibility: Head of Department

Recommendation 3. The Department should increase the number of physics honours students, aiming to double their number.

3A. More motivated, high-achieving high school students may consider physics with a streamed

approach in the first year. This streaming could be done through enhanced labs, or with dedicated courses, but would also help retain stronger students in physics in the transition from first to second year.

Response to 3A.: The department agrees with this overall goal.

Action: The department, with the help of Academic Programme Officer and the chair of Undergraduate Studies will reach out to the new first year physics students who have shown to have a good aptitude for physics (by checking their high school marks) and discuss various (accelerated) options with them and thus hopefully encourage them to consider doing Physics (Honours) degree. The department has also started to send out letters to individual first year students with high marks in their first year physics courses inviting them consider Physics (Honours) degree. Streamed approach in the first year may not be possible due to resource implications.

Responsibility: Head of Department

3B. We recommend that the Department targets second year undergraduates through in-house outreach (such as student-requested research talks or small-group faculty led professional mentoring), and community building, to enhance their identity as physics students and participation in the physics community early in their undergraduate career. This will help retain students in the transition from second to third year.

Response to 3B.: The department strongly agrees with this recommendation.

Action: The department through Undergraduate Studies Committee has in the past year (2015/2016) organized numerous events that targeted second year undergraduate students. We organized pizza lunches with various themes. For example, one event had presentations of former MUN physics alumni who are currently employed industry and health organizations, other event informed students about research activities going on in the department with senior undergraduate students giving short presentations on their Honours thesis work, yet others were focused on the number of speakers (including the CAP tour) that were visiting the department last year. We plan to continue to engage second year students in these and other types of (outreach) activities. In future, individual second-year students who show promise and interest in physics will be contacted and encouraged to pursue one of our programs.

Responsibility: Head of Department and Faculty Members

3C. The Department is already doing excellent school outreach, which should continue. We recommend involving undergraduate students (of all years) in this outreach to further foster the undergraduate community. Also building a stronger pipeline of graduating students into the Faculty of Education will provide job opportunities for graduates and will support high-school links for feeding into the first year class.

Response to 3C.: The department will continue the school outreach and will redouble its effort to get undergraduate students at all levels to be involved in the outreach activities.

Action: The department will, this coming Fall (2016), form a new committee whose focus will be to oversee all of the outreach activities in the department. The new Outreach and Community Service Committee will have representatives from both graduate and undergraduate students on it and will try to actively engage undergraduate students in these outside of the departmental events.

Responsibility: Head of Department

Recommendation 4. **The Department should increase the number of graduate students with NSERC fellowship funding, with a target of 10% of the graduate students.**

4A. MUN undergraduates should be encouraged to apply to NSERC fellowships locally. Enhancing undergraduate honours numbers and training will then, synergistically, grow this pool.

Response to 4A.: The department agrees with this recommendation.

Action: The department with the help of the Undergraduate and Graduate Studies Committees is currently looking at ways of increasing the overall number of undergraduate honours students in our department (see responses to Recommendation 3). We encourage the (eligible) students to apply for NSERC postgraduate scholarships and to name Memorial University as one of their possible locations. We often invite these students to do their MSc thesis research as continuation of their honours thesis projects.

Responsibility: Head of Department and Faculty Members

4B. Individual faculty should target MUN undergraduates for graduate work, especially at the MSc level, and especially if the programme, mentoring, and field-specific research opportunities are competitive with other programmes in Canada. Providing opportunities for undergraduates to participate in CUPC and AUPAC, which the Department already does, allows the students to make informed choices and improves the resulting fit.

Response to 4B.: The department through the various individual faculty initiatives already frequently reaches out to qualified students and engages them in research and outreach events that may lead to students getting a summer employments with faculty members and eventually doing MSc and possibly PhD programmes.

Action: The individual faculty initiatives will be continued. The department through the Deputy Head (Graduate Studies) will target our own undergraduate students for recruitment in the fall of their fourth year by arranging for semi-formal research visits, including lab tours and meeting with faculty involved in their area of research interest.

Responsibility: Head of Department and Faculty Members

4C. MUN should focus recruitment in the region (Atlantic Canada), where its name recognition and reputation can be more efficiently managed and highlighted. Undergraduate summer research experiences for non-MUN students may be an avenue to grow this direction. This may include the organization of undergraduate summer schools that could attract out-of-province students.

Response to 4C.: The department fully agrees with this recommendation.

Action: The department intends to send departmental representative to various undergraduate conferences (such as AUPAC) to grad fairs and encourage (and financially support) faculty members who supervise honours undergraduate students' theses to send these students to regional and national undergraduate conferences and others. The department through the Graduate Studies Committee is now in the process of producing promotional material (such as graduate studies brochure) that will be taken to these conferences. The department also strongly supports applications for summer placement from non-MUN students.

In addition, The Department will target regional students for recruitment by email and mailing promotional material.

Responsibility: Head of Department and Faculty Members

4D. Recruitment of NSERC students is a competitive enterprise. Offering compelling research experiences is not always enough -- significant funding top ups are often required. The Department should provide SGS funds in these circumstances.

Response to 4D.: The department has considered this recently in the Graduate Studies Committee deliberations.

Action: The department on the recommendation of the Graduate Studies Committee has recently increased the overall stipend for both MSc and PhD students. Potential NSERC students have additional funding and a decreased teaching assistantship duties available to them. Funding levels, including the availability of entrance scholarships, will be advertised in any recruitment effort. Funding levels will be reviewed annually and further increased if feasible.

Responsibility: Head of Department

4E. Recruitment of students must be a collective enterprise. The Department should subsidize student visits, and those students should talk with a variety of potential supervisors during their visits.

Response to 4E.: The department in principle supports this.

Action: The current economic and budgetary constrains may make this recommendation not feasible.

Responsibility: Head of Department

4F. Recruitment of strong students from outside MUN requires individual effort, since it requires relationship building with the potential students and with their undergraduate student supervisors. This includes outreach efforts during invited seminars, and at national and regional student events such as CUPC, AUPAC, and CCUWIP.

Response to 4F.: The department agrees with this recommendation.

Action: The department is pursuing all of the above mentioned initiatives (see, for example, the response to recommendation 4C.) and will continue to do so in the future.

Responsibility: Head of Department and Faculty Members

Recommendation 5. The Department should continue to enhance the recruiting of strong international graduate students.

5A. MITACS offers competitive project-based funded undergraduate research experiences for some international partners. While limited in scope, this provides visibility and the opportunity to develop relationships with strong international students that can lead to graduate recruitment. The Department should pursue MITACS opportunities where possible.

Response to 5A.: The department will encourage individual faculty members to take advantage of

MITACS opportunities.

Action: The Head will make sure that faculty members are informed about the various MITACS programmes and their deadlines.

Responsibility: Head of Department and Faculty Members

5B. Given the growing international graduate population at MUN, the Department should coordinate with SGS to provide targeted recruitment, screening, orientation, and support.

Response to 5B.: The department through Graduate Studies Committee, Deputy Head (Graduate Studies) and Graduate ProgrammeCoordinator continues to work closely with the SGS regarding graduate student admission process into the department.

Action: The SGS and other organisations on campus provide personal and academic support to students, which our Department conveys to our students via our website and graduate student information sessions.

We are presently investigating targeted international recruitment, including the creation of promotional material and the use of an exit survey for faculty supervisors of students who have recently left our programs. We plan to use this information to identify sources of qualified applicants from different parts of the world and nurture these connections to encourage more applications. These intitiatives have been discussed with the SGS.

The Department will investigate means of screening foreign applicants with the SGS.

Responsibility: Head of Department and Graduate Studies Committee

5C. It is the combined responsibility of individual faculty and the Department as a whole to accept graduate students into the programme. The minimum standard should be that all students graduate with excellent training and research experiences, in a timely manner, with financial support throughout their degree. A modest reduction of graduate student admission numbers may be necessary to meet this standard.

Response to 5C.: The department, in principle, agrees with this recommendation. However, our opinion is that the greatest challenge to maintaining a minimum standard is the quality of the graduate students that we admit, and the low numbers of well-qualified applications that we receive.

Action: The Department will review applications more stringently than in the past, with an eye to rejecting applicants that will be unlikely to succeed in our program due to poor preparation.

As discussed 5B, the Department plans to investigate ways of increasing the number of well-qualified applicants.

Responsibility: Head of Department, Graduate Studies Committee and Faculty Members

Recommendation 6. The Department should enhance the training and experience of graduate students.

6A. We recommend that the Department increases the minimum graduate stipend towards the national median. While the stipend net of fees, and in light of local costs, appears liveable, a low stipend will turn off excellent students with multiple offers. We caution that low stipends will hamper efforts to strengthen the student body. As in 5C., a modest reduction of graduate student numbers may result from

increases of the minimum stipend. However, we believe that it will benefit the Department as a whole.

Response to 6A.: The department on the recommendation of the Graduate Studies Committee has approved graduate students stipend increases in the Winter 2016.

Action: The Department is currently considering other minor adjustments to graduate student stipends. When this is finished, all of our graduate students will have clear idea what their funding will be based on their individual situation. The Department will review graduate student stipends on an annual basis.

Responsibility: Head of Department

6B. We recommend a one-day orientation programme for all new graduate students, in conjunction with a graduate handbook outlining research, supervision, community, and teaching expectations for their graduate career.

Response to 6B.: The department through the Deputy Head (Graduate Studies) has initiated meetings with graduate students. We believe a full day orientation is not needed since graduate students are getting various information from TA orientation and other department meetings.

Action: Deputy Head (Graduate Studies) will organize general information meeting inviting all graduate students to attend the meeting once a semester. At that meeting general information about current events in the department, safety, student health resources, and scholarships will be discussed amongst other things. Students will be given an opportunity to raise their own concerns. The first meeting of this type has already taken place on June 1, 2016 and the next one will be held on October 5, 2016.

Responsibility: Head of Department

6C. We support a comprehensive curriculum review and reform at the graduate level, which the Department has already planned. Care should be taken to have the graduate programme both attractive and useful to undergraduate honours students considering an MSc, and to international students without extensive laboratory training. One possible course to consider is a "professional skills" course, to address literature review, refereeing, scientific writing, critical reading, and presentation skills. This could include teaching pedagogy. Another possibility is an "experimental tools" course, to address contemporary experimental tools and techniques available to the department and the underlying physics informing them.

Response to 6C.: The department may consider a comprehensive curriculum review and reforms at graduate level once the undergraduate curriculum review is completed (which will not be finished for at least another year). The department already has a graduate course Physics 6900, Techniques in Experimental Condensed Matter Physics which is offered on a yearly basis.

Action: Graduate Studies Committee will consider the logistics of offering the "professional skills" course and report to the department as whole.

Responsibility: Head of Department

Recommendation 7. The Department should formulate a strategic hiring plan.

7A. Since the last review, the Department hired, renewed, and retained two tier II CRC (Chen and Tarasov). Tarasov's renewal will end in 2017. We strongly urge the Department to pursue new CRC (at the tier I or tier II level), as it is a proven path to recruit excellent faculty.

Response to 7A.: The department strongly believes that competing for a new CRC is worthwhile thing to do in the near future.

Action: The department will start putting together a new CRC application (after collegial consultation with faculty members) during 2016/17 academic year in preparation for the next (possible) competition in 2017/18 academic year.

Responsibility: Head of Department or Delegate

7B. The Department's ratio of theoretical to experimental physics faculty is approximately 1:1. This is roughly double the typical ratio in physics departments in Canada. This ratio affects space and startup funding needs, collaborative opportunities, programme offerings, and student quality requirements. The Department should reflect on what that ratio should be, and include it as an explicit (rather than implicit) strategic goal. We note that while it is generally a "buyer's market" for theorists, since they have fewer industrial opportunities, this is not a compelling reason to hire them disproportionately.

Response to 7B.: The department research profile includes a strong theoretical/computational component that spans across our two main research areas, physical oceanography and soft condensed matter. This component facilitates collaborations within the department and is our strength. Faculty hires over the past 10 years have been predominantly on the theoretical/computational side driven in part by a lack of laboratory space. This has increased the ratio of theoretical-to-experimental physics in the department. We do not desire the ratio to increase beyond the current value of roughly 1:1. The department, therefore, requires that, space permitting, new faculty hires in the coming five years will be predominantly experimentalists.

Action: Currently, the department is in the process of formulating its Strategic Plan. It is anticipated that the next hiring(s) will occur in 2019-2021 timeframe. Provided that the Strategic Plan will call for the hiring of experimentalist(s), the department will act on it and make the appropriate request(s) to the Dean of Faculty of Science.

Responsibility: Head of Department

7C. Compelling theoretical research requires excellent students, and so a large proportion of theoretical researchers strongly feeds into our Recommendations 4-6.

Response to 7C.: The department agrees with this.

Action: See responses to Recommendations 4-6.

Responsibility: Head of Department

7D. Compelling experimental research requires significant investment in research space. Research space is a timely concern, given the new science building and building renovations. Future experimental hiring directions need to be identified now, with adequate laboratory space available for their research. We note that future research involving liquid helium cryogen may be precluded by the current plans of the new science building.

Response to 7D.: The department through the Space Committee will be consulting with the Dean

regarding the space allocation in the Physics/Chemistry building before the Chemistry Department moves to its new location (Core Science Building).

Action: The Dean has started the process of soliciting information regarding space needs from the departments remaining in the their (old) buildings. We will be proactively participating in this process and requesting the appropriate research space for our department.

Responsibility: Head of Department and Dean of Faculty of Science

7E. Compelling experimental research also requires significant investment in startup funds, and competitive startup (at the $200k-$500k level) is often required to successfully recruit strong candidates and set them up for success. The annual budget cycle does not allow the department to "bank" startup funds, and CFI opportunities are slow and uncertain from the point of view of prospective faculty. We strongly suggest that the Department works proactively with the Dean to develop creative approaches to bank startup funds for experimental hires. This may, e.g., require delaying approved experimental hires.

Response to 7E.: The department will be consulting with the Dean on this startup issue. This matter has been made more difficult in the current dire economic (provincial) situation. We would like to strongly emphasize that the startup funding (in addition to laboratory space) is a critical issue related to our future hiring. We strongly believe that every effort should be made so that appropriate funding will be available for the future faculty members.

Action: The department will work with the Dean on getting competitive startup funds for the recent (new) and future faculty hires.

Responsibility: Head of Department and Dean of Faculty of Science, Senior University Managers

7F. Envisaged engineering physics or medical physics programmes may require new faculty with suitable professional accreditation. While close collaboration with the Faculty of Engineering and the Faculty of Medicine may provide some of those positions, this will also imply a long term strategic commitment for future hires. Individual faculty outside of the traditional strength of the Department, in e.g. astrophysics, is another way in which programme considerations might affect strategic hiring directions. We recommend that any such strategic programme initiatives only be undertaken if research excellence can be maintained with all hires.

Response to 7F.: The department is currently formulating its Strategic Plan. This plan will determine if and when we will pursue the engineering physics and/or medical physics programmes (or possibly other programmes).

Action: No action at this time until it becomes clear what the long range plans are for the department.

Responsibility: Head of Department

Recommendation 8. The third-year course PHYS 3900 should be revisited with a view to reduce the unfavourable reputation it appears to have amongst some potential physics students. Whether this is strictly perception (requiring outreach into second year), or whether it is substantive (requiring recalibration of the workload), corrective action appears to be needed.

Response to 8.: The department, in consultation with the faculty members (Kris Poduska and Mike

Morrow) who have taught this course, is enlisting more help for this lab course.

Action: One of our senior instructional assistants (hopefully to become laboratory instructor in a year or so) will provide extra help in running this lab course (i.e. setting up the labs as well as writing the lab manuals and other supervisory duties). This process of introducing more help in PHYS 3900 has already been started and hopefully will make this (restructured) lab more enticing to future students. Other changes are also planned.

Responsibility: Head of Department

Recommendation 9. The Department should support their Laboratory Instructors and Instructional Assistants in their requests to Human Resources for evaluation of their roles and responsibilities, and in their desire for improved career advancement opportunities and improved compensation. Possibilities for professional development should also be explored and supported.

Response to 9.: The department is very appreciative of the excellent work that Laboratory Instructors and Instructional Assistants have been doing in the laboratories and in the help center. Two of our instructional assistants (IA) have been operating at the level of lab instructors for several years and another does computer support far outside the IA job description. Consequently, we are very supportive of their requests to Human Resources for evaluation of their roles and responsibilities.

Action: In the Winter/Sping 2016 timeframe, a number of us (Senior Administrative Officer, Academic Programme Officer and myself) have met with the three of the lab staff (Kelly Shorlin, Marek Bromberk, Justin Pittman and others) to discuss their submissions of job fact sheets to Human Resources for evaluation (and possible advancement) of their current positions. In the process we have reassigned some of the laboratory duties to improve their chances for advancement and to insure smooth transition of them into possible (supervisory) laboratory openings in the future (due to retirements of some of the senior lab personnel). Kelly Shorlin will share supervisory duties with John Wells in the first year laboratories. Marek Bromberk will help out in the senior laboratory and Justin Pittman will coordinate activities in the second year laboratory together with Chris Deacon. In due course other laboratory staff members will also be considered and help with the evaluation process.

Responsibility: Head of Department

Recommendation 10. Network speeds should be improved to campus norms as soon as is practical. This is unlikely to be a "within building" problem, so could be addressed by the university (with the Dean's support) even before renovations to the Chemistry Physics building.

Response to 10.: The department supports this recommendation.

Action: The Head will raise this issue with the Dean of Faculty of Science.

Responsibility: Head of Department, Dean of Faculty of Science, Senior University Managers

Recommendation 11. The Department should pursue "in kind" contributions of ship time from the Marine Institute, perhaps in conjunction with outreach activities of the Marine Institute. We note that this access could be useful even while the ships are at dock. Alternatively, we recommend that the university pursues occasional access for students on a more formal basis with the Marine Institute.

Response to 11.: The department agrees that enhancing access to ships would be of benefit for both the undergraduate and graduate students.

Action: The department will review our existing courses to determine which would most benefit from some activity on ships. We will also consult with the Marine Institute to determine what ship options might be available to us. The Department Head will consult with the Dean of Science to determine if there is funding support for the use of ships in our teaching program **.**

Responsibility: Head of Department, Dean of Faculty of Science

PHYSICS AND PHYSICAL OCEANOGRAPHY

Academic Unit Planning

Site Visit Itinerary (February 11-13, 2016)

Thursday, February 11th Room: C3024		Friday, February 12th Room: C3024		Saturday Feb 13th
8:00 AM 9:00 AM	Welcome Breakfast – Panel meets with Dean of Science, Dean of Grad Studies, and AUP Coordinator **(A2029)**			**Panel: Draft Report**
9:00 AM 9:30 AM	Organizational Meeting: Panel and AUP Coordinator	9:00 AM 9:30 AM	Organizational Meeting: Panel and AUP Coordinator	
9:30 AM 10:30 AM	Departmental Head Tour of Facilities	9:30 AM 10:00 AM	Physical Oceanography Group: Afanassiev, Demirov, deYoung, Munroe, Tarasov, & Zedel	**Room: C3024**
		10:00 AM 10:30 AM	Administrative Staff: Coombs, Corbett, Simmons, and Wade	
10:30 AM 11:00 AM	Dr. Lagowski – Department Head	10:30 AM 11:00 AM	Safety Committee: Beaulieu, Deacon, Poduska, Wells, and Whelan	
11:00 AM 11:30 AM	Undergraduate Students	11:00 AM 11:30 AM	Lab Instructors and Assistants: Bromberek, Deacon, Hayden, Jerrett, Men, Pittman, Shorlin, and Wells	
11:30 AM 12:00 PM	School of Graduate Studies: Andrew Kim	11:30 AM 12:00 PM	CMP/Experimental Group: Andrews, Beaulieu, Chen, Morrow, Poduska, Quirion, and Yethiraj	
12:00 PM 1:30 PM	Lunch with Unit Head and Deputy Heads	12:00 PM 1:30 PM	Panel Working Lunch	
1:30 PM 2:00 PM	System Administrators: Jerrett, Perry, & Stevenson	1:30 PM 2:00 PM	~~Dr. Stephanie Curnoe~~ (Cancelled)	
2:00 PM 3:00 PM	Graduate Studies Committee	2:00 PM 3:00 PM	Meeting with the whole department	
3:00 PM 3:30 PM	Graduate Students, Postdocs, and Research Assistants	3:00 PM 3:30 PM	Panel confers for exit meetings	
3:30 PM 4:30 PM	Undergraduate Studies Committee	3:30 PM 4:00 PM	Exit Meeting with Dean of Science (by phone) (Panel shares preliminary findings)	
		4:00 PM 4:30 PM	Exit Meeting with Unit Head (Panel shares preliminary findings)	
4:30 PM 5:00 PM	CMP/Theoretical Group: Curnoe, Evstigneev, Lagowski, Plumer, Saika-Voivod, and Wallin	4:30 PM 5:00 PM	Exit Meeting with Unit Head, Faculty, Staff, and Students (Panel shares preliminary findings)	
5:00 PM	Suggested time for panel to confer	5:00 PM	Suggested time for panel to confer	
7:00 PM	Working dinner for panel to discuss meetings and report writing	7:00 PM	Working dinner for panel to discuss meetings and report writing	

Review Panel Members:
Dr. Marco Merkli, Department of Math and Statistics **(Panel Chair)**
Dr. Colin Farquharson, Department of Earth Sciences
Dr. Andrew Rutenberg, Department of Physics and Atmospheric Science, Dalhousie University
Dr. Yves Gratton, Department of Physical Oceanography, Institut National de la Recherche Scientifque (INRS)