

McGILL UNIVERSITY - MEDICAL PHYSICS UNIT ANNUAL REPORT 2013

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I. Activity Summary

I.1. Background

The main areas of interest in medical physics at present are: (i) treatment of cancer by ionizing radiation (radiation oncology physics); (ii) diagnostic imaging with x rays, ultrasound and nuclear magnetic resonance (diagnostic radiology physics); (iii) diagnostic imaging with radionuclides (nuclear medicine physics); and (iv) the study of radiation hazards and radiation protection (health physics). In recent years medical physics has grown into a complex multidisciplinary science with involvements and affinities to biomedical engineering, health and life sciences, systems biology and biophysics.

Medical physics is also a rapidly expanding profession and job opportunities for graduates of medical physics programs remain promising locally, nationally and internationally. McGill's Medical Physics program has been in existence for over 35 years and the program is playing a world leading role in academic training of professionals in medical physics.

The accreditation of graduate and residency programs in medical physics is generally provided by the *Commission on Accreditation of Medical Physics Educational Programs* (CAMPEP) sponsored by four organizations: the *American Association of Physicists in Medicine* (AAPM); the *American College of Medical Physics* (ACMP); the *American College of Radiology* (ACR); and the *Canadian College of Physicists in Medicine* (CCPM).

The MPU graduate programs in medical physics were first accredited in 1993 for a period of 5 years and reaccredited in 1998, in 2003, 2008 and 2013 for an additional 5-year period. McGill was the third university in North America with such accreditation and between 1993 and 2004 it was the only Canadian university with such an accreditation.

Since 1997 the MPU also provides a residency program in radiation oncology physics. In this program graduates in medical physics receive a structured clinical-professional training in radiation oncology physics. The program received its first accreditation in 2000, and was re-accredited in 2005 and 2010 for an additional 5-year period. The current accreditation will expire on December 31, 2015. McGill is one of eight institutions in Canada and one of 53 in North America with this type of accreditation.

Information about the MPU, its clinical, research and academic mission can be found under www.mcgill.ca/medphys

I.2. Highlights

I.2.1. Research and Publications

Year 2013 was a relatively successful year in terms of output: 60 peer reviewed publications by MPU members; 98 abstracts; 29 invited presentations and 86 conference presentations. For complete listings, please consult Appendix IX-XII under: <http://www.mcgill.ca/medphys/academic/annual-report-2013>

Similarly, the overall grant and project support revenue for year 2013 amounted to ~1.1 \$M. For a listing of grants, projects and contracts please consult [Appendix XIII](#).

I.2.2. Teaching and learning

Eleven M.Sc. students in medical physics graduated during 2013. Five of these students became Ph.D. students (three at McGill, one at U de Montreal, one at Carleton University), four became clinical medical physics resident and two took up positions as clinical medical physicists at Hopital Maisonneuve Rosemont. One Ph.D. student (Eunah Chung) graduated in medical physics (through the Department of Physics, March 2013). She was accepted shortly thereafter to a Residency position at the University of California-Davis. Please consult [Appendix II](#) for the full list of graduated students. Demographic data is given in [Appendix III](#).

During the 2013 calendar year, 3 residents completed the two-year Residency Training Program in Radiation Oncology Physics (E. Mitrou, M. Morcos, G. Twork). The number of McGill University Residency graduates, since first program accreditation in 2000, amounts to 26; the number of residents in the program currently is 13. A listing of the graduates and various relevant data are provided in [Appendix IV](#).

The teaching distribution during the 2013 calendar year is shown in the list of instructors for didactic courses in [Appendix V](#). During the 2013 calendar year, all 12 mandatory graduate courses underwent evaluations by students. The results were circulated to staff, are filed in the MPU office, and their summaries without instructor identification are enclosed as [Appendix VI](#).

All individual instructors were evaluated separately and also 2 laboratory courses, having several instructors each, were evaluated based on the course itself as opposed to an individual instructor. On a scale of 1 (bad) to 5 (excellent) and averaged over all registered students, the evaluations for the Winter 2013 semester ranged from 3.35 to 4.99 and for the Fall 2013 semester they ranged from 4.56 to 5.00.

A conclusion can be made that the MPU students are reasonably satisfied with the quality of education they receive, but that they also send a message to certain instructors that improvements in their teaching methods and attitudes could be made. Considering that the majority of individual instructors who taught didactic or laboratory courses during the 2013 calendar year come from the ranks of clinical physicists who partially volunteer their time and efforts to the academic activities of the MPU, the teaching evaluations attest to an excellent

collaboration between the academic and clinical physicists of the MPU as well as to considerable commitment from the clinical staff to offer good quality teaching.

Students who began, either their first year, second year, or additional session of M.Sc. medical physics studies in Fall 2013 are listed in [Appendix VII](#). The 13 students at various stages of their Ph.D. thesis work during Fall 2012 are listed in [Appendix VIII](#). All 13 have either passed the preliminary examination at the Physics department of McGill or their comprehensive project committee at the BME department.

The employment situation of M.Sc. medical physicists has become more restricted in the face of the 2014/2016 ABR/CCPM deadline (ABR: American Board of Radiology; CCPM: Canadian College of Physicists in Medicine). By this time every clinical medical physicist wishing to sit for the certification exams of the ABR or CCPM must come from a CAMPEP (CAMPEP: Commission for Accreditation of Medical Physics Education Programs) accredited residency program. Despite the increase in CAMPEP-accredited residency programs, access to these programs is severely restricted for M.Sc. graduates, since they compete often with Ph.D. candidates applying to the same positions. The recruitment philosophy of the MPU M.Sc. program, hence, is tending towards recruitment for candidates who are more likely interested in the Ph.D. program. In the past year the recruitment cohort of M.Sc. candidates consisted of 62 candidates, out of which the incoming cohort for September 2014 is expected to consist of 9 students with GPA typically above 3.5.

During 2013 the MPU received a grant from the Natural Sciences and Engineering Research Council under the CREATE program (Collaborative Research and Training Experience) in support of a Training Network designated Medical Physics Research Training Network (MPRTN). This structure provides resources for medical physics research training to a network consisting of McGill MPU, U Laval and collaborators from National Research Council, Canadian Nuclear Safety Commission, MGH Proton Centre, and industry. More information can be found on www.mprtn.com.

I.2.3. Accreditation review and cyclical review

During the year 2013, the MPU was reviewed by the Commission for Accreditation of Medical Physics Education Programs (Campep; <http://campep.org>). The accreditation review document was largely complementary, offered some suggestions but unconditional reaccreditation for 5-years (2013-2018) was received.

The unit also underwent Cyclical Review with site visit in November 2013. The report was again largely complimentary, but pointed to two key points and six other issues, that must be addressed. The two key points in the report were:

1. *“The structure of the unit makes it vulnerable to any of the core academic members leaving. As an example, the devastation by the recent departure of Dr. Bruce Pike was cited. Retention of the current director is seen by the review committee as a priority. Further, the review committee recommends (1) Five positions to be secured at the university to be*

- staffed with a mix of junior and mid-career scientists. (2) Elevation from Unit status to Departmental status.*
- 2. "The imminent retirement of the core experimental Radiation Biologist (Dr. Lehnert) leaves a hole in the wet-lab capability of radiation biology expertise within (or accessible to) the unit."*

In the MPU response a proposal to develop a business plan for a transition to Departmental status was mentioned. Transitioning to Departmental status is a medium-term objective. With regards to point 2, the curriculum update committee is already considering a new format for the course taught by Dr. Lehnert. However, the only solution to the vacuum created by the retirement of Dr Lehnert is to recruit a replacement radiation molecular biologist.

One of the six other points raised by the review committee, was **dry-lab space**. The need for dry lab space on the Glen has been pointed out to both Faculty and RI-MUHC on different occasions. Currently, the MPU will be housed in the Cancer Centre at the Glen. The dry lab space for this will be inadequate and, in the short term, consist of borrowed clinical space. The RI MUHC should provide the dry lab space following the same rules as wet lab space. This is currently not the case.

I.2.4. Involvement in the community

Members of the MPU are actively involved in clinical duties and also take up significant roles in professional and scientific committees and boards. [Appendix XVI](#) and [Appendix XVII](#) summarize the committee memberships within McGill and outside McGill, respectively. Of particular note are activities in committees of prestigious organizations such as the International Atomic Energy Agency (IAEA) and the International Commission for Radiation Units and measurements (ICRU).

I.2.5. Partnerships

Members of the MPU have a broad network of collaborators worldwide. Examples of these are international collaborations with hospitals and laboratories in Belgium, the UK, the US and others.

Another very important partnership development has improved the capacity of the MPU medical physics residency program. This is done through the so-called *hub-and-spoke model for residency training* that is being developed by MPU together with partner centres. The MPU is the host and several satellite centres are affiliate institutions for medical physics residency training. The MPU-MUHC has partnership agreements with (1) St. Peters (Albany); (2) U. Laval (CHUQ); (3) U. Montreal (CHUM); (4) Trois-Rivieres; (5) JGH and (6) Oman. During the year 2013, this model has significantly developed and the current number of clinical medical physics residents in the hub-and-spoke model is 13 (see [Appendix IV](#))

I.2.6. Milestones

During the year 2013, the selection of the tenure-track faculty, Dr. Shirin Enger (Uppsala, Sweden) was concluded. Dr. Enger joined the department on Aug 1, 2014.

During 2013 all clinical medical physicists at the MUHC and the JGH that were not yet part of the MPU nor appointed as CAS-professional or CAS-research in the Department of Oncology became affiliate member of the MPU.

MPU member Dr. Bruce Pike left McGill in September 2013 to take up a position at the University of Calgary. Dr. Pike remains a member of the MPU and adjunct professor in the Department of Physics and, to date, continued to supervise some MPU Ph.D. students.

I.2.7. Honors, awards and prizes

The year 2013 was a very successful year with regards to scholarship awards to students. They can be summarized as follows:

Student Name	Scholarship type/agency	Supervisor
Ian Gerard	Brain Canada-CIBC	D.L. Collins
James Renaud	CIHR (CGS)	J. Seuntjens
Robert Maglieri	CNSC (Govt, Canada)	J. Kildea
Sangkyu Lee	EIRR21 (CIHR, Toronto)	I.El Naqa & J Seuntjens
Marc-André Renaud	FQRNT	J Seuntjens
Piotr Pater	FRSQ	I El Naqa & J Seuntjens
Alexandra Bourque	MSSS (Medical Physics)	JF Carrier (CHUM)
Dominique Guillet	MSSS (Medical Physics)	F. Deblois
Daniel Markel	RI-MUHC	I El Naqa
Martin Carrier-Vallieres	NSERC (CGS)	I El Naqa
Eric Christiansen	TOHCC scholarship	E. Vandervoort (TOHCC)
Joannie Desroches	FQRNT-NSERC (BMP Innovation bursary)	F Leblond (Polytechnique)
Ghada Aldosary	Saudi Arabian Cultural bureau	A. Sarfehnia
Ola Maria (PDF)	Strauss Fellowship (McGill)	I El Naqa

Further awards or honors obtained/maintained in 2013 are:

1. **Pike, G. Bruce:** James McGill Professor, McGill University, 2007-2013.
2. **Pike G. Bruce:** Killam Professor, Montreal Neurological Institute, 2003-present.
3. **Reader, Andrew:** Killam Professor, McGill University, 2012-present.
4. **Martin Carrier-Valieres:** student won the J.S. Laughlin award at the Annual meeting of the American Association of Physicists in Medicine. (AAPM) (supervisor: I. El Naqa)

5. **Issam El Naqa:** Outstanding reviewer for the journal “International Journal of Radiation Oncology, Biology, Physics for the year 2013.

I.2.8. Fundraising

During 2013, the MPU Alumni Committee established the “**Ervin B. Podgorsak Scholarship for Graduate Studies in Medical Physics**” and organized an inaugural reception on September 17, 2013 with the presence of Dr. Podgorsak and his family as well as university officials, colleagues and friends. The goal of the scholarship is to support outstanding Medical Physics students at the M.Sc. level in their studies. By creating this scholarship, the MPU is making a commitment to sustain Dr. Podgorsak’s dedication to academic excellence through increased student funding. Through the generous support of our faculty, alumni, and friends, the MPU fundraising committee hopes to create a scholarship fund by raising at least \$10,000 per year for a minimum of four years. More information can be found on <http://www.mcgill.ca/medphys/scholarship-0>.

Members of the MPU also inaugurated the Facebook group “McGill Medical Physics Alumni and Friends” (<https://www.facebook.com/groups/McGillMPU/>)

II Unit Status Update

II.1 General objectives of the Medical Physics Unit

- 1) To promote the field of medical physics through teaching, research and clinical service.
- 2) To encourage interest, education, training and research in medical physics.
- 3) To join in one academic unit (Medical Physics Unit) the various members of McGill departments, McGill University Health Centre and Jewish General Hospital who, through their academic training in physics, engineering or a related science and through work in clinical and academic environments, support the objectives (i) and (ii) above.
- 4) To offer a graduate program leading toward an M.Sc. degree in medical physics.
- 5) To offer, in conjunction with McGill’s Physics and Biomedical Engineering departments, a graduate program leading toward a Ph.D. degree in medical physics.
- 6) To offer a residency program in radiation oncology physics.
- 7) To maintain CAMPEP accreditation of the M.Sc. and Ph.D. academic programs as well as the residency training program in radiation oncology physics.

- 8) To offer support to other institutions wishing to provide a residency program in radiation oncology physics through affiliation with the CAMPEP-accredited McGill program.
- 9) To encourage, promote and excel in research in the application of physics in diagnosis and treatment of human disease.
- 10) To promote McGill as an important institution in the international medical physics community through excellence in teaching of, and research in, medical physics.
- 11) To promote national and international medical physics organizations through active participation of the Medical Physics Unit and its members in these organizations.
- 12) To encourage links and collaboration between medical physicists, clinicians and basic scientists with the goal of developing and improving methods for diagnosis and treatment of human disease.
- 13) To provide medical physics consultation services to McGill institutions, national and international organizations and the general public, as required.
- 14) To initiate a structured student recruitment program at the Ph.D. level and to provide a stimulating research environment to these candidates.
- 15) To work with clinicians and basic scientists in the development of a strategic research program in radiation oncology.
- 16) To work with industry, government agencies, other CAMPEP accredited programs as well as international academic institutions to update and modernize the graduate programs so that graduate students have access to expertise and equipment most suitable for their project and education.

II.2 Specific objectives for 2014-2015

The goals for the upcoming academic year revolve around the response to the cyclical review report, the deployment of the MPRTN CREATE program as well as the need to further develop the Unit's research capacity and support structure:

- 1) To continue rebuilding the academic program staffing and appoint more CAS-research (with salary source MUHC) faculty
- 2) To continue graduate program curriculum revisions commensurate recent developments in Medical Physics and its interaction with associated sciences. To establish the CREATE courses as outlined in the CREATE proposal
- 3) In response to the cyclical review report (January 2014), to develop a business plan for the future of the MPU, including consideration for Departmental status;
- 4) In response to the cyclical review report (January 2014), to address the course teaching of Radiation Biology and recruitment of faculty for Rad. Biol.;

- 5) To further improve the MPU's operating budget to cover adequately the teaching responsibilities of non-McGill clinical physics staff (rate at McGill is \$2400 per credit).
- 6) To maintain and increase productivity with regard to standard academic indicators (number of publications, presentations, graduating students, etc.).

II.3. Overview Of McGill Medical Physics Program, staff and committee structure

Details regarding the graduate programs and research in medical physics can be found on the Medical Physics Unit website at: mcgill.ca/medphys.

Established:	September 1979 by the Faculty of Medicine of McGill University Montréal	
Directors:	M. Cohen	(September 1979 to August 1991)
	E.B. Podgorsak	(September 1991 to December 2008)
	J. Seuntjens	(January 2009 to present)

GRADUATE PROGRAMS:

- | | |
|--|---|
| • Graduate Program Director (GPD): | Jan Seuntjens, Ph.D., FCCPM, FAAPM |
| • Degrees offered: | M.Sc., Ph.D. and Certificate program in medical physics |
| • Accreditation: | CAMPEP* accredited the M.Sc. & Ph.D. programs since 1993 |
| • Re-accreditation: | CAMPEP* re-accredited both programs (1998, 2003, 2008, 2013): |
| • M.Sc. degrees conferred to date: | 210 |
| • Ph.D. degrees conferred to date: | 31 |
| • Current M.Sc. student enrollment: | 16 |
| • Current Ph.D. student enrollment: | 12 |
| • Number of mandatory courses: | 12 (M.Sc), 2 (Ph.D) |
| • Number of academic faculty: | 7 |
| • Number of clinical faculty: | 19 |
| • Number of affiliated members | 2 |

RESIDENCY PROGRAM IN RADIATION ONCOLOGY PHYSICS:

- | | |
|--|--|
| • Residency Program Director (RPD): | William Parker, M.Sc., FCCPM |
| • Accreditation: | CAMPEP* accredited the Residency program in 2000 |
| • Re-accreditation: | CAMPEP* re-accredited the program (2005, 2010) for 5 y |
| • Number of graduates to date: | 37 |
| • Current enrollment: | 6 |
| • Program duration: | 2 years |
| • Number of mandatory rotations: | 4 |
| • Number of mandatory courses: | 4 |

The **staff** (see [Appendix I](#)) of the MPU consists of 27 staff members (25 internal, 2 affiliated) and a full-time Administrative Coordinator (Margery Knewstubb). The MPU Administrative Coordinator holds the only permanent staff position in the MPU, and organizes the day-to-day activities of the MPU, deals with graduate students on a daily basis, corresponds with potential applicants to the medical physics program, and records minutes of MPU staff meetings.

The MPU is run by a Director who is appointed by the Dean of Medicine. Since 1991 the directorship of the MPU is a part-time position, and is filled by the director of the *Medical Physics Department* of the McGill University Health Centre. All academic members of the MPU, except for the two affiliated members, hold primary appointments in other major departments either of the McGill's Faculty of Medicine. For more information see [Appendix I](#). The two affiliated members work outside McGill; Dr. R. Richardson at the Atomic Energy of Canada in Chalk River, Ontario and Dr. W. Wierzbicki at the Maisonneuve-Rosemont Hospital in Montreal. Both have special links with the MPU, Dr. Richardson as an academically inclined health physicist and Dr. Wierzbicki as a lecturer and thesis supervisor.

The main responsibilities of clinical physicists are related to clinical aspects of radiation therapy; however, the clinical physicists get involved with teaching of didactic medical physics courses and laboratories, as well as with co-supervision of M.Sc. graduate students. The engineers are involved with teaching of medical electronics.

Four committees help with the running of the MPU: the *Graduate Committee*, *Seminar Committee*, the *Curriculum Update Committee* and the *Alumni Committee*.

The **Graduate Committee** (Dr. J. Seuntjens, chair; M. Knewstubb; Dr. J. Kildea; Dr. I El Naqa, Dr. P. Francois (Dept Physics)) evaluates applications to the academic programs, decides on the number of candidates to be accepted for a particular academic year, and recommends the most suitable candidates for admission. During the 2011-2012 and the 2012-2013 academic years, 56 and 59 complete applications were received by the MPU, respectively, and the graduate committee recommended to McGill 24 and 15 candidates for admission into the 2011-2012 and 2012-2013 academic cohorts, respectively. For more information, please see Section 8.C.

The **Seminar Committee** (Dr. E. Soisson, local arrangements MUHC, Dr. J. Kildea; JGH: Dr. S. Devic) organizes the medical physics seminar series, a bi-monthly collection of seminars given by MPU staff, outside visitors or graduate students to staff and students of the MPU. The medical physics seminars organized during the Winter semester 2012 and the Fall & Winter semesters of the 2012-2013 academic year are listed in [Appendix XV](#).

The **Curriculum Update Committee** (chair Dr. J Seuntjens, Dr. I El Naqa, Dr. J Kildea, Dr. A. Syme, Mr. W. Parker) reviews the curricula for the M.Sc. and Ph.D. programs.

The **Alumni Committee** (chair Dr. E. Soisson, Dr. J Seuntjens, Dr. J Kildea, M. Knewstubb, T. Nisic) aims to organize and improve the relations between the MPU and its alumni. One initiative is the establishment of the Ervin B. Podgorsak Scholarship for studies in Medical Physics (See Highlights, Section I.2).

III. Grants, publications, and service outside of McGill

III.1. Publications

The calendar year 2013 in relation to teaching, research, and service was a normal year for the MPU, with all performance indicators fairly stable in comparison to previous academic years. As demonstrated by the lists of [publications](#) (x60, *Appendix IX*), **published abstracts** (x98, [Appendix X](#)), **invited presentations** (x29, [Appendix XI](#)), and **presentations at national and international conferences** (x86 [Appendix XII](#)), all for calendar year 2013, the MPU staff are productive, representing with distinction McGill's involvement in medical physics research.

Historical academic productivity of MPU staff from 1996 to December 31, 2012 can be found at the following URLs:

<http://www.medphys.mcgill.ca/academic/listofpublications.html>

- list of published papers;
- list of published abstracts;
- list of invited presentations;
- list of presentations at national or international meetings.

III.2. Grants

The listing of research and teaching grants held by the MPU staff ([Appendix XIII](#)) also attests to the respectable professional standing of the MPU staff members. It should be noted that the grants are generally attained under the auspices of the grantee's primary department. Current research interests of the 27 MPU academic staff members are shown in [Appendix XIV](#).

III.3. Committees and Boards

As shown in [Appendices XVI](#) and [XVII](#), the MPU staff members are active on committees and boards within and outside of McGill. Currently, the MPU members serve on Boards of Directors of the two Canadian medical physics organizations: the *Canadian College of Physicists in Medicine* (CCPM) and the *Canadian Organization of Medical Physicists* (COMP). MPU staff members currently also serve on Boards of American Medical Physics organizations: the *Commission on Accreditation of Medical Physics Education Programs* (CAMPEP); the *American Association of Physicists in Medicine* (AAPM); and the AAPM Summer School, International Atomic Energy Agency (IAEA), and International Commission of Radiation Measurements and Units (ICRU) Task groups, Work Groups, committees and subcommittees.

III.4. Other academic activities of the MPU

Three **meetings of the MPU academic staff** were held during the 2013 calendar year. In January, 2013 completion of the first and start of the second semester of the 2011-2012 academic year; in May 2013, completion of the second semester and start of M.Sc. thesis research work of the 2011-2012 academic year and in September 2013, start of the 2012-2013 academic year. The purpose of the staff meetings is to discuss the issues affecting the MPU in general and the performance of graduate students in particular. Minutes of each staff meeting are taken by the graduate coordinator and distributed to staff and the Dean of Medicine as soon as possible following each meeting. The minutes of all staff meetings are filed in the MPU office and available for inspection upon request.

During the Winter semester of the 2012-2013 academic year and the Fall semester of the 2013-2014 academic year, the MPU organized regular **medical physics seminars** given by staff, graduating students or visiting scientists. The frequency of the seminars averaged two per month in the Fall semester and one per week in the Winter semester (*location*: Osler Amphitheatre at the Montreal General Hospital; *time*: Friday noon). The presentations are video linked to the JGH to allow MPU members there to attend without significantly disturbing their clinical activities. The attendance of seminars is mandatory for graduate students and is verified through a sign-in sheet. A seminar committee chaired by Dr. E. Soisson organizes the seminars and a listing of the MPU medical physics seminars during the 2013 calendar year is given in [Appendix XV](#).

All McGill graduate students in medical physics are required to attend **weekly formal research presentation meetings** (Fridays at 9:15 a.m.). The presentations are given either by staff or students. At least once every three months each student presents his or her research work and results, and thus gains practical experience on organizing and giving scientific presentations. The speaker of a given seminar is introduced by the presenter of the previous seminar. Student attendance is compulsory and verified through a sign-up sheet. The senior Ph.D. student, who also serves as a student representative, organizes the weekly research seminars and organizes the sign-up sheet.

All graduate students attend the weekly **informal research meetings** (Thursday 11:30 am) where students discuss daily problems and solutions in their research projects preceded by a review of journal papers. Discussions are performed in subgroups where students working on related subjects discuss. There are currently four subgroups of 3 to 5 students: (1) beam modeling and modulated electron therapy; (2) dosimetry and clinical; (3) imaging and (4) radiobiology. In each group students are responsible to invite attendance of MPU staff suitable for their projects. Each fourth meeting is a group meeting of the entire group, with compulsory attendance of all students.

The weekly **clinical physics meetings** of the MUHC Medical Physics Department are open to graduate students and some with particular interests in radiation oncology attend them regularly. Students are also encouraged to attend the **weekly seminars** organized by the Radiation Oncology Department.

Students are strongly encouraged to submit their work for presentation at national and international scientific meetings, either as regular presentations or as presentations during young investigator symposia. During the past 11 years, MPU students received 6 awards in the J.R. Cameron AAPM young investigator symposia, 4 awards in the J.R. Cunningham COMP/CCPM young investigator symposia, and 1 award in the young investigator symposium of the ICCR.

III. Discussion of performance

As evident from the *Highlights* (Section I.2) above and the *Appendices* to this report, the MPU staff and students have during the 2013 calendar year continued to bring some prestige to the University. They also fulfilled the basic objectives of the MPU. The MPU is known worldwide for its high quality teaching programs, and its M.Sc. and Ph.D. graduates generally do not have difficulties in finding suitable jobs upon graduation.

As shown in *Appendices II* through *IV*, graduates of McGill medical physics programs and the residency program are distributed in institutions throughout Quebec, Canada, North America and around the World; quite a number of them in leadership positions. This attests to high standards of the McGill programs, helps with the retention of the CAMPEP accreditation, and attracts high quality graduate students into the programs.

One may state that 2013 was relatively stable for the MPU in relation to teaching, research, and service, with all performance indicators similar to those of previous academic years, providing the M.Sc. and Ph.D. students in Medical Physics with the academic standards they expected from McGill.

The Cyclical Review carried out in 2013 was largely complimentary, however, it points out that the stability of the Unit in future years requires consideration of elevating the MPU to Departmental status.