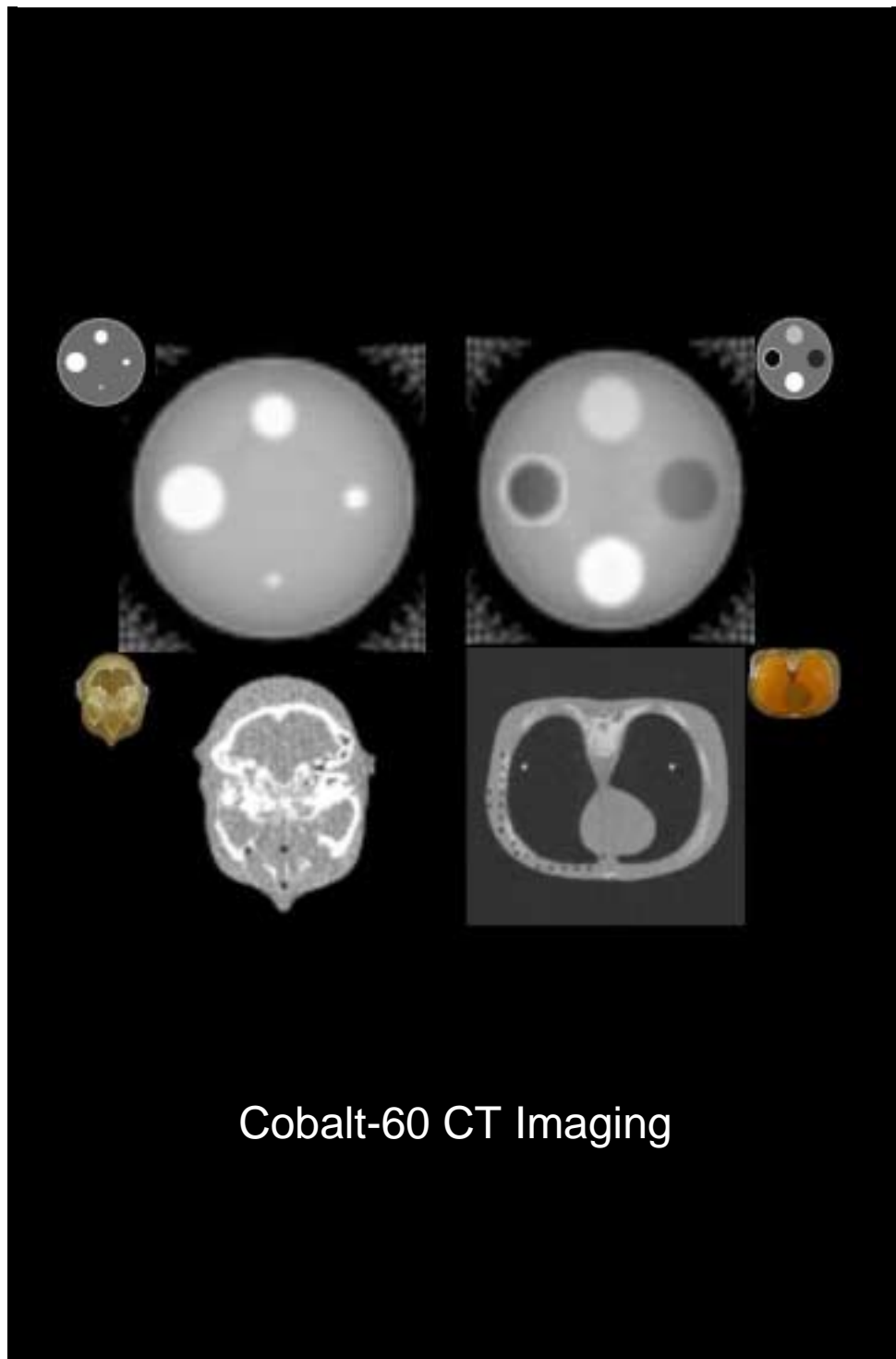


# InterACTIONS

CANADIAN MEDICAL  
PHYSICS NEWSLETTER  
Le BULLETIN CANADIEN  
de PHYSIQUE MÉDICALE



Cobalt-60 CT Imaging



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## About our Cover

Part of the excitement associated with the development of tomotherapy is that a tomotherapy unit, with its CT-like gantry, would also easily provide for CT imaging immediately prior, and perhaps even during, the radiation treatment. At the Kingston Regional Cancer Centre we have been investigating the potential for the use of Cobalt-60 for a tomotherapy source. In undertaking this work we have developed a 1<sup>st</sup> generation rotate-translate jig for investigations of cobalt tomotherapy. In the progress of this work we decided also to investigate the potential for CT imaging using a cobalt source. The front cover shows a collage of four images taken using our 1<sup>st</sup> generation Cobalt CT scanner. The images show phantom studies with high-density plugs of variable dimensions (5 mm to 3 cm diameter) or variable density (air, lung and bone equivalent materials, and aluminum) and also two images of slices through a RANDO anthropomorphic phantom. We believe that these preliminary images indicate a strong potential for cobalt imaging; at least sufficient to enable set up verification and to be used for subsequent dose reconstruction with cobalt tomotherapy

*Courtesy Dr. John Schreiner, Kingston Regional Cancer Centre.*

The Canadian Medical Physics Newsletter, which is a publication of the Canadian Organization of Medical Physicists (COMP) and the Canadian College of Physicists in Medicine (CCPM) is published four times per year on 1 Jan., 1 April, 1 July, and 1 Oct. The deadline for submissions is one month before the publication date. Enquiries, story ideas, article submissions can be made to:

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Please submit stories in Publisher 98, Word 6.0, Word 97, or ASCII text format. Hardcopy submissions will be scanned to generate an electronic document for inclusion in the Newsletter. Images in Tiff format at 300 dpi resolution are preferred.

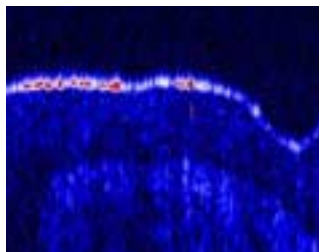
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## Message from the COMP Chair:

although, the COMP annual meeting does not require recognition from external sources, (CAMPEP) accreditation does facilitate the re-certification process for our members who are certified by Canadian and American organizations

The main COMP event since my last address was, of course, the Annual Meeting in Beautiful Kelowna, BC. This meeting introduced many firsts for the Canadian medical physics community: a) the participation of the Executive Director, b) the electronic submission and presentation of conference talks, and c) the CAMPEP accreditation of the CCPM Symposium and the COMP annual scientific meeting. The hard work involved with the electronic submission through the world-wide-web had to be done by in-house experts at minimal costs. We were very fortunate that our in-house experts were truly exceptional, and thus capable of completing their responsibilities and tasks without a glitch. I would like to sincerely thank the local arrangement committee for organizing and designing the submissions, and for overseeing the meeting procedures in such an efficient manner. An additional attraction or first at this year's Meeting was the distribution of plaques to former Chairs of COMP and Presidents of the CCPM. Starting this year, all COMP Executive (and CCPM Board) completing their office term will receive a plaque of appreciation. I believe the ceremony of plaques did add a special flavor to the night-out, and would probably remain one of the highlights of future night outs at the Annual meetings.

Returning to the CAMPEP accreditation, although, the COMP annual meeting does not require recognition from external sources, accreditation does facilitate the re-certification process for our members who are certified by Canadian and American organizations. I believe we should pursue this avenue for future meetings. The application process is now a simple matter, since we can now simply use our successful application as template for all future applications. We are thus following the trend in North America of accrediting scientific meetings and workshops to give attendees credits that are to be used for re-certification.

A reminder of the definition of Emeritus is appropriate. To be eligible for this category, one must first be eligible for the "retired" category, which means one may not practice medical physics for remuneration or be paid for work in any other field. A list of retired members is to be reviewed by the Executive for consideration of "emeritus" status.

A procedure of steps has been designed to remind members who are delinquent in paying their dues, of the benefits of remaining a member of the COMP and prompting them to pay their dues. Hopefully, this will help us keep a "tab" on members who are late with



their dues and encourage them to remain active members of the organization.

The Executive considered that now was a good time to promote the role of medical physicists in hospitals, as this is a time of major health care reform and restructuring. Letters describing the role of medical physicist will be drafted and reviewed by the executive, and then sent to the Ministries of Health of the provinces and the CEOs of large institutions. Secondly, we would try to arrange a meeting with the Romanov Commission on Health Care to discuss the role of medical physicists in health institutions. Hopefully, these actions would ensure that only appropriately qualified individuals could call themselves medical physicists, that there is appropriate participation of medical physicists at the decision processes in health institutions, and that the profile of medical physicists in health institutions is increased. We are happy that our Executive Director has experience in government, and would be able to comment intelligently on the drafting of this letter and arrange a one-to-one meeting with the Romanov Commission on Health Care.

*(Continued on page 132)*

# Message from the CCPM President:

I would like to take this opportunity to bring all of you up-to-date with CCPM issues that came out of the Kelowna meeting in July. To begin, I wish to congratulate Alistair Baillie and Brenda Clark for organizing an excellent CCPM Symposium and to thank all the



speakers for their contributions to a very fine day of science. I would also like to thank Alistair and the members of the local arrangements committee (Cynthia Araujo, Darcy Mason, Rasika Rajapakshe, Larry Watt) and their support team (John Wolters, Jim Moffatt, Greg Hovde and Sheri Aubin) for putting on an outstanding Canadian Medical Physics Meeting. I believe that the attendees had a very good time and found the facilities excellent. As always the talks were, throughout all sessions, of outstanding quality.

A number of major issues were discussed during the summer Board meetings earlier in the week in Kelowna. One issue concerned how we should continue to maintain and develop our standards for College membership and fellowship. Standards documents are now being drafted so that the expectations for College accreditation are clearly identified to the medical physics and related communities, in Canada and internationally. One long discussion had to do with our certification processes and how they fall in line with those of other certifying bodies. It was apparent that our examination processes for both membership and fellowship should be reviewed. This is discussed by Brenda Clark

in an accompanying article in this issue of *InterACTIONS*. This is a 'discussion in progress' and we wish to solicit views from the membership. Please read Brenda's article and communicate to Board member any thoughts.

The requirement for feedback on important issues for the College also became clear at this year's Annual General Meeting. The AGM went quite well for the most part, and college members will soon receive the minutes from that meeting. However, I feel that there was some frustration from the general membership (and from Board members) caused by the constraints imposed by the short duration we had to deal with our business. At the AGM, the Board attempts to present in an hour or so a short, but hopefully complete, series of reports on College activities and to move some action items that have to be ratified by the membership. As usual this year, some of these items generated considerable discussion. This is a good thing, and the Board is very happy to see these discussions proceed. However, it is frustrating for us when these discussions must be limited because of the time constraints of the AGM. It is for this specific reason that I as president, and the rest of the Board, regularly solicit comments from you on College issues. I do not believe I have written one message during my tenure without asking for feedback from the membership. Also, as mandated in our bylaws, any change of bylaws is announced in *InterACTIONS* before the AGM also soliciting comments. I can state categorically that response to all these requests has been poor. Therefore, it is interesting to suddenly see heartfelt discussion generated on just these issues when they are brought forward at the AGM. It is clear that people have very strong views of how the College should be doing its business. So I again encourage you to present your views to the Board now, so that we have an opportunity to reflect on and consider your views in our discussions. I will extend this invitation also to medical physicists not yet certified by the College. If these issues are left to the AGM, we will unfortunately not be able to have complete discussion before we move to other agenda items. Enough said.

Given that, the AGM in fact, went relatively smoothly. I believe the membership understands some of the constraints under which we are working. Everyone is very busy and this year the Board had a considerable change of officers taking on new duties. There were also some growing pains as we tried to make more

*(Continued on page 133)*

our examination processes for both membership and fellowship should be reviewed. This is discussed by Brenda Clark in an accompanying article in this issue of *Interactions*

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# Message from the Executive Director of COMP/CCPM

In the coming issues of *Interactions*, I will use this space to highlight strategic issues facing the organizations and profession. Your feedback will help guide our contribution to your work

It's a pleasure to be writing my first *Interactions* submissions since becoming Executive Director of COMP/CCPM. I had the opportunity to meet many COMP/CCPM members at the Kelowna in July and was struck by the commitment, energy, and positive approach of the organization and college.

It is clear that members are well aware of the challenges facing the profession, ranging from research funding, standards, professional recognition, and the challenge of responding to the requirements placed on the organization to participate in national and international initiatives and to further the position of the profession within Canada.

COMP and CCPM thrive because of the tremendous efforts of many volunteers in the profession. The achievements of the two bodies are significant and wide ranging. In the coming months and years, I hope to be able to add to that work and assist the COMP and CCPM as the organizations grow in number and impact in our country.

Barb at the COMP office and I are committed to contributing to that growth and impact potential. We welcome any suggestions, ideas, or advice you have for us. In the coming issues of *Interactions*, I will use this space to highlight strategic issues facing the organizations and profession. Your feedback will help guide our contribution to your work.

Looking forward to working with you!

Michael Henry  
Executive Director





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September 17, 2001.

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Stephen Balter, PhD  
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Dear Drs. Coffey and Balter:

It was with deep shock and sorrow that the Canadian Medical Physics Community followed the events in the northeastern United States last week. Words cannot express our feelings. However, we do wish to offer our condolences to you our friends and colleagues. We especially bring to mind those who may have lost friends and loved ones.

Our thoughts and prayers are with you.

Sincerely,

L. John Schreiner, Ph.D., FCCPM  
President, CCPM

B. Gino Fallone, Ph.D., FCCPM, ABMP  
Chair, COMP

# Proposal for Membership Exam Revision

By Brenda Clark  
Vice President, CCPM  
email: bclark@bccancer.bc.ca

CANADIAN  
COLLEGE OF  
PHYSICISTS IN  
MEDICINE



LE COLLÈGE  
CANADIEN  
DES PHYSICIENS  
EN MÉDECINE

The board of the CCPM constantly reviews the Membership and Fellowship examination processes to provide continuation of the standards set in previous years, to maintain credibility of certification with employers and other professional groups and to ensure continuing equivalence with other Medical Physics certification.

Although currently Medical Physicists in Canada are not licensed professionals as are, for example, physicians and engineers, there are definite indications that licensing will become an issue in the future. Some provinces, notably Quebec, are actively pursuing this option and licensing of Medical Physicists is now established in several US states such as, for example, Florida and New York.

While CCPM certification is highly regarded within the Medical Physics community, there appears to be some confusion with respect to the two levels of certification. The CCPM bylaws define Membership as a certification of "competence" and Fellowship as "advanced certification demonstrating excellence". These definitions will shortly be further clarified by standards documents which are currently in draft form at the Board of the College.

Increasingly it is becoming apparent that certification of competence in clinical Medical Physics demands an oral component to the process (see for example Dr Bhudatt Paliwal's article in the AAPM Newsletter vol 25, 2000). One of the major requirements of a Medical Physicist in clinical practice is the ability to communicate effectively with other professionals and patients in the clinical environment. The ABR, ABMP and all medical specialties have oral components to their certification process, as do Ontario physicists through the CCO Review 'A' process.

While this requirement is recognised and forms part of the certification/licensing process of comparable medical professionals, the CCPM has until now reserved that aspect for the Fellowship level, where the oral examination does not merely address compe-

tence but is designed to measure "excellence". The absence of an oral examination at the Membership level has led to the perception by some medical physicists in Canada and abroad that our Fellowship examination is merely a final part of the basic certification process rather than a designation of excellence above clinical competency.

To address this issue, the board of the CCPM will be considering a proposal to add an oral examination at the Membership level. This proposal will be discussed at the mid-year board meeting in November. The Board realises that this is a considerable step and this article is to solicit input from the CCPM membership and other medical physicists prior to that discussion. At the same time, the Board will be bringing greater clarity to the difference between the two levels both in terms of the meaning of the certification MCCPM and FCCPM and the method to obtain each one. The immediate plan is to retain the current Fellowship certification process but the Board may consider changes to this process at a later date. Please address any comments on this topic to me or any other board member *before 9 November 2001*.

The details of the proposal are:

**Timeline:** If approved by the Board, the appropriate revision of the bylaws would be published in the January edition of *Interactions* for a general membership vote at the 2002 AGM. The first oral examinations would be conducted in 2003.

**Eligibility:** Any physicist who has passed the written component of the Membership exam. (The structure of the written exam would remain the same.) To obtain certification at the Membership level, the candidate would be required to submit to an oral examination which would likely be scheduled immediately prior to the annual COMP/CCPM meeting. Note: *existing members in the College will not have to do this oral exam to maintain their membership*. If implemented, this oral exam would only apply to appli-

*(Continued on page 133)*



# Minutes of the 2001 COMP AGM

## Kelowna, BC, July, 2001

**Chair:** Gino Fallone  
**Secretary:** Curtis Caldwell

55 Full Members of the COMP were present (quorum was 32).

Fallone called the meeting to order at 5:45 pm.

1. Adoption of the agenda. George Mawko moved that the agenda be adopted as presented. Second: John Schreiner. *Motion carried.*
2. Minutes of the 2000 AGM. These minutes had previously been published in the Newsletter. Mawko moved that the minutes to accepted as written. Second: Katharina Sixel. *Motion carried.*
3. Business Arising from the minutes:
  - (a) CSNM: Mawko is now the COMP's representative on the Board of the CSNM.
  - (b) CAPCA: This organization is developing technical standards of practice in radiation oncology. The COMP is represented by Peter Raaphorst and John Andrews. The process has only started. Schreiner stated that we also have representation at the Human Resources Working Group of the CAPCA. Peter O'Brien has some involvement as well, in his role as Chair of the Radiation Regulations Committee.
  - (c) CAMPEP: This is the first year the COMP scientific program and the CCPM symposium have been accredited for CAMPEP points. The CCPM may use CAMPEP records in the recertification process in the future.
  - (d) CRISM: There is a need to replace our current representative, Paul Johns. Fallone thanked Johns for his work at CRISM. A new representative should be in place by the Fall of 2001.
4. CCPM President's Report: Schreiner reported that the CCPM has 82 Members, 97 Fellows, and 7 Emeritus Members now. The CCPM is a sponsoring group of the CAMPEP, with two representatives (Brenda Clark and Peter Dunscombe) on the CAMPEP Board.
5. COMP Chair's Report: Fallone reported that the Executive had decided to increase the reimbursement rate for car travel on the COMP's behalf (from \$0.28/km to \$0.33/km). Fallone introduced Michael Henry, our new Executive Director, and asked him to say a few words to the membership about what he will be doing. Henry spoke briefly about his expectation that he will be trying to establish stronger relationships between the COMP and vendors, as well as working to increase the public and professional profile of Medical Physics in Canada.
6. Treasurer's Report: Steven Pistorius reported that the COMP's finances had been audited and found in good order by Randall Miller. Pistorius presented COMP's balance sheet for 2000 and proposed a budget for 2002. Ken Shortt questioned the absence of line items related to the Montreal meeting in 2002. It was explained that the Montreal meeting would be simply a AAPM meeting, not a joint AAPM/COMP meeting. Pistorius made a motion to accept the 2002 budget as presented, seconded by Mawko. *Motion carried.* Pistorius then explained that the COMP Executive had decided to move the payment due date for COMP membership fees from 31 January to 31 December (i.e., the fees for 2002 would be due on 31 December 2001). This will help distribute the COMP's income over two calendar quarters. Otherwise, we may exceed the \$50,000/quarter limit, after which we would have to charge GST (including GST on that \$50,000).
7. Report of the Nomination Committee: Michael Patterson reported that no nominations had been received for the position of COMP Secretary. Therefore, the Nomination Committee found a qualified and willing individual to stand for Secretary, Ms Alanah Bergman. A mail-out ballot to all Full COMP Members occurred, and 87 ballots were returned, all votes for Bergman. Bergman is therefore elected Secretary of the COMP. Patterson welcomed Bergman to the Executive. Patterson then asked the membership for guidance on whether we can do away with the election process in the case of there being only one individual on the ballot for the position. Patterson asked whether elections by acclamation would be agreeable to the membership, as the ballot process seems to be a waste of time and money in this case. Our by-laws seem to prevent write-in candidates. There was some discussion of running an election electronically via the website. Paul Johns was against election by acclamation. He felt that allowing a ballot, with a write-in candidate option, would allow the membership to speak out if in major disagreement with the choice. Also, election by acclamation means that the membership may be even less aware of the possibility of proposing someone for a position on the Executive – we may never have another true election. After discussion, Patterson moved that, in the case of there being only one person standing for election for a given Executive position, that person be elected by acclamation without a mail-out or electronic ballot. Second: Ken Shortt. *Motion carried* with six opposed. Patterson encouraged the Membership to nominate more candidates in the future.
8. Report of the Professional Affairs Committee. David Wilkins reported that one of the major items on the committee's plate was development of a manpower database for medical physics in Canada.

(Continued on page 114)

9. Report of the Radiation Regulations Committee. Peter O'Brien reported that there would shortly be a compilation of federal and provincial radiation safety regulations posted to the COMP website. The committee is active in the process of development of Quality Assurance Standards for radiation oncology, in defining the radiation safety requirements for intravascular radiation therapy, and in defining the qualifications needed to be an RSO.
10. Report of the Communications Committee: As the Chair of this committee, Michael Kolios, was not at the meeting, Darcy Mason reported in his stead. During the last year, the committee has focused its attention on developing the website and on the on-line part of the conference preparations. Pat Cadman is to be congratulated for maintaining the high standards of the Newsletter and for adding new features. The CCPM exam booklet has been placed on the website. Ccpm.ca and medical-physics.ca have been registered by the COMP. Comp.ca cannot be registered because someone has already registered some version of comp.province.ca. Mason appealed for members who are interested to come forward to replace some of the committee members who will soon be leaving the committee.
11. Secretary's report. In the interest of time, Fallone reported the following summary of Membership numbers on the Secretary's behalf:

Category	July 2000	July 2001	Change
Full	288	319	+31
Associate	0	0	0
Student	49	51	+2
Retired	1	3	+2
Emeritus	11	9	-2
Corporate	22	22	0
Totals	371	404	+33

Fallone also discussed the requirements for "Emeritus" status. To be eligible for this category, one must first be eligible for the "retired" category, which means one may not practice medical physics for remuneration or be paid for work in any other field. In addition, one must have made extraordinary achievements in Medical Physics.

12. Vigilance. Fallone reported that the biomedical engineers' website lists "medical physics" as one of the items that biomedical engineers do. Fallone protested to the engineers about this, but it is not certain that the reference will be permanently removed. The PMB website lists the CAP as its Canadian contact, instead of the COMP. The PMB apologized for this and will have it fixed. We all need to be vigilant that these types of things do not go unchallenged.
13. Conferences:
- (a) Kelowna. Fallone thanked Alistair Baillie and his LAC team for their tremendous efforts on the COMP's behalf. Baillie reported that there were 152 registrants to the meeting (slightly fewer than expected), including about 20 vendor representatives. It is likely the conference will "break-even" financially.
- (b) Montreal 2002. Michael Evans is the COMP's representative to the AAPM local arrangements committee. The LAC is charged with arranging the Companions program and with the AAPM night-out, which will occur on the Tuesday. The only night available for the COMP to have a "Canadian Night Out" is the Wednesday. We need to have the AAPM designate a "Canadian" hotel, so COMP members will have a place to congregate. **Action:** Fallone to contact AAPM regarding "Canadian hotel" (possibly the Delta). COMP members will be informed by e-mail once a Canadian hotel has been designated. COMP and CCPM business meetings should be held at McGill or at the Montreal General Hospital. **Action:** Michael Evans to arrange for rooms (including those needed for the Fellowship exams). There is also a need for inexpensive residence accommodations for students. **Action:** Michael Evans to look into procedure to reserve a block of rooms in the Victoria College residences.
- (c) Edmonton 2003. Fallone reported that the conference will occur 19 to 22 June 2003 at the University of Alberta hospital campus. Ample space is available. Inexpensive residence accommodations are available. There are hotels within walking distance.
- (d) Winnipeg 2004. Pistorius made a motion that the COMP meet jointly with the CAP from June 12 to 16 2004 in Winnipeg. This was seconded by Mawko. *Motion carried.* This meeting will be hotel based, but there will be inexpensive accommodations at the university residences (and a shuttle bus service to the residences). The details have yet to be worked out. We will attempt to keep fees low, will try to have a CCPM symposium and proceedings.
14. AOB Pistorius made a motion accept Randall Miller as the auditor for the COMP's finances for 2001. Second Mawko. *Motion carried.* Fallone thanked Caldwell for his work as Secretary.
15. Motion to adjourn by Clement Arsenault. Second Schreiner. *Motion carried* at 6:30.

---

# Report from the Radiation Regulation Committee of COMP CCPM

September 6, 2001

**By Peter O'Brien**  
**Chair, Radiation Regulation Committee**

The current membership of the committee is:

Peter O'Brien , Toronto, (chair)  
John Aldrich, Vancouver  
Clement Arsenault, Moncton  
Harry Johnson, Winnipeg  
George Mawko, Halifax  
Cheryl Duzenli, Surrey

The following were the major activities of the committee during the last year:

1. Comments were submitted on a new Radiation Protection Bureau Safety Code for Small Radiological Facilities (Prepared by John Aldrich).
2. Comments are being prepared on Canadian Nuclear Safety Commission Draft Regulatory Guide C-091 - Ascertaining and Recording Radiation Doses to Individuals (Cheryl Duzenli)
3. An article was submitted to Interactions outlining the use of the new CNSC guides for licensees. (Arseneau and O'Brien)
4. There was considerable activity regarding the issue of cremation for deceased patients who had recently been implanted with radioactive iodine-125 seeds. The CNSC does not have a specific policy for this issue. Greg Kennelly in Vancouver has examined the risks and proposed a policy for the British Columbia Cancer Agency. William Que in Toronto revisited the issue and will be publishing his results in Medical Physics. The issue has also been raised by Peter O'Brien at the Advisory Committee on Radiological Protection.
5. The committee issued a reminder, in a note in Interactions, about the necessary procedures to follow before the introduction of new brachytherapy sources
6. The project to produce a national quality assurance program for radiation therapy is proceeding. A draft document of standards has now been produced and circulated to all stakeholders for comment. A new draft will be prepared this fall. In general, most stakeholders are supportive of the intent but there are some issues about process. We will be attempting to gain the support and involvement of the newly formed Canadian Association of Provincial Cancer Agencies (C.E.O. Dr. D. Carlow)
7. Most recently the committee circulated an IAEA report on the radiation therapy accident in Panama.
8. There will be changes to the membership of the committee over the next year. Dr. Cheryl Duzenli will assume the position of chairperson at the mid-year meeting. Dr. Clement Arsenault will be leaving the committee this year.

# COMP Treasurer's Report

June, 2001

Submitted by: Stephen Pistorius, CancerCare Manitoba

## 2000 Financial Year:

The 2000 financial statements of the organisation were audited by Mr. Randall Miller and have been found to be in good standing. As of Dec 31, 2000 the net worth of the organisation stood at \$153,161 with \$90,502 being held in our current account and \$62,270 being the value of our GIC investments.

The total income during the period 1 Jan 2000 to 31 Dec 2000 was \$80,105. This is somewhat higher than previous years because unlike past years we have included revenue received for 2001 dues and subscriptions prior to Dec 31, 2000. The income from member's dues for 2000 was on budget with the slight increase in revenues over budget being principally associated with increased corporate memberships.

Expenses were \$77,995 during the same period. The most significant one time expense was that associated with CAMPEP. The COMP banquet at the World Congress made a small profit and the mid year meeting came in under budget. The expenses for the Executive Director were significantly under budget because the position was not filled for most of the year. The newsletter was over budget although part of this is due to overdue advertisement accounts.

Overall we were well under our projected \$23,000 deficit even if we discount the \$6,897 income associated with the 2001 dues and subscriptions.

## Interim 2001 Report

As of May 31, 2001 the conference income stood at \$33,429 and these monies have been transferred to the LAC. Further transfers will be made as needed and final accounting will take place later in the year. The balance (Jun 26, 2001) in our chequing account stands at \$67,841.35. I have increased our GIC investments by another \$50,000 and we have \$113,000 invested for various terms and interest rates.

## 2002 Budget

The 2002 budget that was approved by the membership at the AGM projects an income of \$47,500 and planned expenses of \$80,500.

Balance Sheet				
Date:		December 31, 2000		
Account	Description	January 1, 2000	12/31/00	Notes
<b>ASSETS</b>				
6644-0717-0308413	Bank Account	\$148,142.72	\$90,502.66	1
6644-8044395	GIC Accounts	\$0.00	\$62,270.03	
	Office Float	\$0.00	\$2,000.00	2
<b>TOTAL ASSETS</b>		<b>\$148,142.72</b>	<b>\$154,772.69</b>	
<b>LIABILITIES</b>				
4520 7080 0044 4449	Credit Card Balance		\$1,610.88	
	Other			
<b>TOTAL LIABILITIES</b>		<b>\$0.00</b>	<b>\$1,610.88</b>	
<b>Assets less Liabilities</b>		<b>\$148,142.72</b>	<b>\$153,161.81</b>	

1. January 1, 2000 assets held in current account and by previous treasurer  
2. \$2000 float maintained for use by Secretariat

## Income Statement

From: January 1, 2000  
Through: December 31, 2000

Description	2000
<b>REVENUE</b>	
CCPM	\$2,182.14
Deposit Adjustments	\$475.00
Donations	\$100.00
Dues (2000)	\$42,685.50
Dues (2001)	\$5,797.13
Investments	\$1,576.76
Membership List	\$200.00
Newsletter	\$2,200.00
Other	\$38.28
Scientific Meeting	\$13,884.24
Subscription	\$10,965.99
<b>TOTAL REVENUE</b>	<b>\$80,105.04</b>
<b>EXPENSES</b>	
ABR/CMA Accreditation	\$490.00
Awards/Support	\$126.00
Bank Charges	\$315.94
CAMPEP	\$12,563.13
CCPM	\$2,727.55
Committee Expenses	\$3,841.78
Corporate Fees	\$60.00
Deposit Adjustments	\$440.00
Directory & Publications	\$3,310.68
Executive Director	\$3,615.65
Mid Year Meeting	\$7,448.97
Miscellaneous	\$30.00
Newsletter	\$7,627.75
Office	\$3,086.72
President's Discretionary Fund	\$250.00
Scientific Meeting	\$12,961.86
Secretariat	\$7,700.00
Society Memberships	\$1,776.98
Subscriptions	\$9,610.09
Other	\$12.00
<b>TOTAL EXPENSES</b>	<b>\$77,995.10</b>
<b>TRANSFERS</b>	
Transfers to GIC Account	-\$59,750.00
Transfers from M. Evans	\$148,142.72
<b>TOTAL TRANSFERS</b>	<b>\$88,392.72</b>
Revenue less Expenses	\$2,109.94
Account Balance at Year End	\$90,502.66

## Budget

Description	2001	2002
<b>REVENUE</b>		
Dues	\$42,000.00	\$42,000.00
Investments	\$5,000.00	\$5,000.00
Membership List	\$200.00	\$500.00
<b>TOTAL REVENUE</b>	<b>\$47,200.00</b>	<b>\$47,500.00</b>
<b>EXPENSES</b>		
ABR/CMA Accreditation	\$1,500.00	
Archive	\$2,000.00	\$2,000.00
Awards/Support	\$1,500.00	\$2,000.00
Bank Charges	\$500.00	\$500.00
CAMPEP	\$1,000.00	\$5,000.00
Committee Expenses	\$5,000.00	\$5,000.00
Directory & Publications	\$3,000.00	\$3,000.00
Executive Director	\$17,000.00	\$19,000.00
Mid Year Meeting	\$12,000.00	\$16,000.00
Newsletter	\$4,000.00	\$5,500.00
Office Expenses	\$2,000.00	\$2,000.00
Plaques	\$1,000.00	\$1,000.00
President's Discretionary Fund	\$3,000.00	\$4,000.00
Secretariat	\$6,500.00	\$8,000.00
Society Memberships	\$2,000.00	\$2,500.00
Web Site Development		\$5,000.00
<b>TOTAL EXPENSES</b>	<b>\$62,000.00</b>	<b>\$80,500.00</b>
Revenue less Expenses	-\$14,800.00	-\$33,000.00

# Physics of Mammography Course 2001 — Review

**By Rasika Rajapakshe**  
**Cancer Centre for the Southern Interior,**  
**Kelowna BC**

The Physics of Mammography 2001 was held very successfully at the Okanagan University College North Campus in Kelowna on July 10 and 11, 2001 prior to the COMP annual meeting. There were 20 attendees coming from Newfoundland to Vancouver Island.

The course consisted of eight hours of didactic sessions on film-screen mammography during the day followed by a three-hour hands-on session held at the Kelowna Medical Imaging and Kelowna Screening Mammography Centre on the evening of July 11<sup>th</sup>. The hands on sessions included test equipment cross calibration, artifact evaluation and CAR (RMI) accreditation phantom scoring. The following day consisted of five hours of didactic sessions on Digital Mammography and CAR accreditation process.

There were seven faculty who participated in teaching activities: Martin Yaffe, Gord Mawdsley, Larry Filipow, Rasika Rajapakshe, Wayne Middelkamp (Radiologist, Kelowna General), Kathy Grabher (Consulting Technologist, SMPBC) and Jamie-Ellen Macdonald (Kodak Canada, Mammography).

AGFA Canada, BC Cancer Agency, GE Medical Systems Canada, and Kodak Canada provided financial assistance for the course.

Kudos to the faculty for their time and energy spent in teaching the course and Ian Cunningham for his help in organizing this event. Finally thank you to all the participants, without whom the course would not have been such a success.

## Co-60 Plaque unveiled in Saskatoon

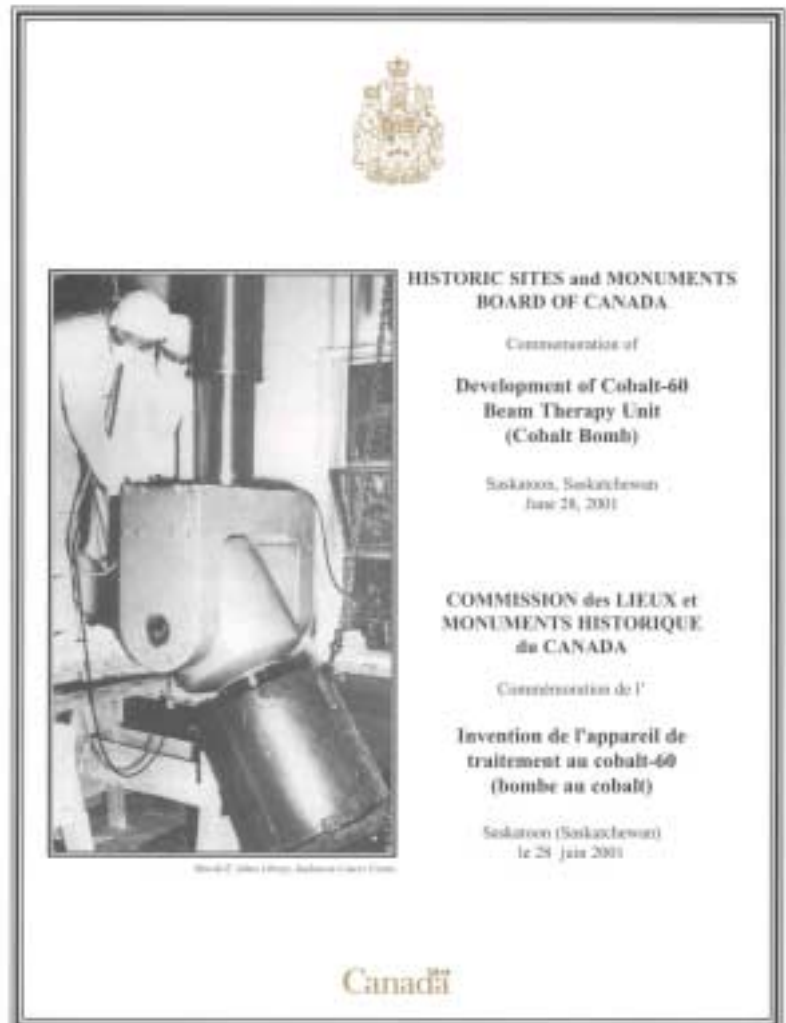
On June 28, 2001 an event took place at the Saskatoon Cancer Centre to commemorate the development of the Cobalt-60 Beam Therapy Unit in 1951 (Cobalt Bomb). This development represents one of the most significant breakthroughs in the fight against cancer.

The ceremony participants were: Mr. Brian Saunders, Board Member, Historic Sites and Monuments Board of Canada; His Worship James Madden, City of Saskatoon; Mr. Peter MacKinnon, President of the Uof S; and three of UofS graduate students who worked with Harold Johns on the development of the Cobalt Bomb--Dr. Edward R. Epp, Dr. D.V.Cormack and the Honourable Sylvia Fedoruk.

The photograph to the right is of Johns and John Mackay of Acme Machine and Electric during the installation of the Co-60 source .

The staff at the Saskatoon Cancer Centre are continually reminded of this important contribution if they look to the ceiling while entering the Chemotherapy area on the Ground Floor at the SCC.

Pat Cadman



# And the Award goes to ...

**By Clément Arsenault,  
Chair, Awards Committee**

After a one-year hiatus, the COMP Awards Committee was back at work in Kelowna to hand out the awards for the Jack Cunningham Young Investigators' Symposium and the Poster Session. As in the past, the talks presented by the young investigators were a good example of the excellent work being done in our Canadian universities. I wish to congratulate this year's participants for the quality of their presentations. The winners of the YIS Awards were:

- 1<sup>st</sup> Place: Tamie Poepping (U.W.O. and J.P. Robarts Research Institute), "Four-dimensional ultrasound measurements in carotid artery bifurcation models",
- 2<sup>nd</sup> Place: James Mainprize (Sunnybrook and Women's College Health Sciences), "Direct conversion detectors for digital mammography",
- 3<sup>rd</sup> Place: Andrew Jirasek (U.B.C. and BC Cancer Agency), "An FT-Raman study of polymer gel sensitivity and structure for dosimeter optimization".

The Poster Awards are given to the two best posters presented at the meeting. This year's winners were:

- 1) David Wilkins (Ottawa Regional Cancer Centre), "Radiobiological considerations in fractionation of radiotherapy for prostate cancer",
- 2) Raoul Pereira (Seaman Family MR Research Centre, U of Calgary), "Effect of b-value on contrast for diffusion-weighted magnetic resonance imaging assessment of acute ischemic stroke".

Finally, I would like to thank the judges of the YIS competition and the Poster Session who were willing to take some of their valuable time to judge the presentations. The difficulty of the task was apparent as I watched the judges tally their results. I hope I have not made any enemies!! Thanks again for your help. It was greatly appreciated.



Raoul Pereira and Clément Arsenault



David Wilkins, Clément Arsenault



Clément Arsenault,  
Andrew Jirasek,  
Tamie Poepping and  
James Mainprize

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# High Resolution Subsurface Imaging with Optical Coherence Tomography:

## Basic Principles and Biomedical Applications

By Alex Vitkin, PhD, MCCPM  
Radiation Physics, Princess Margaret Hospital  
Medical Biophysics, University of Toronto

### Introduction

Optical imaging has long been the gold standard of disease assessment in medicine through its role in histopathological examination of excised tissues. In this sense, optical microscopy is the ultimate medical imaging modality. However, a thin slice of tissue, fixed and stained beyond recognition, and sitting on a sample stage of a bulky microscope, is not most people's idea of medical imaging. Can optical technology be adopted for comparable high-resolution visualization of intact tissues, to probe tissue microstructure below the surface and reduce the need for tissue excision? With the exception of ocular structures, the penetration of UV / visible / IR radiation in mammalian tissues is very limited, so extracting subsurface imaging information appears difficult. Furthermore, when the radiation does penetrate appreciably into tissues (of the order of centimeters in the red and near IR regions of the electromagnetic spectrum), it is subjected to extensive multiple scattering. This resultant diffuse photon field further complicates the task of subsurface high resolution imaging, as multiply scattered photons carry limited spatial information. Yet these challenges are successfully addressed by a new medical imaging technique known as optical coherence tomography (OCT). Although OCT's imaging depth is indeed limited (1-3 mm in turbid mammalian tissues), its resolution of 5-30  $\mu\text{m}$  is considerably better than MRI, CT, or ultrasound. In addition, OCT scanners are not limited to examining superficial layers of skin or other exposed body sites; with the advent of fiber optic technology, the linings of internal body cavities (where many cancers originate) are now amenable to OCT examinations. The technique is currently under active development in several research institutions around the world, with emphasis on technological improvements and demonstration of clinical utility. In this article, we discuss OCT's principle of operation and demonstrate its use in selected biomedical applications.

### Principle of Operation

OCT has been described as the optical analogue of pulsed-wave ultrasound imaging. There is some truth to this comparison, in that the detected signal appears as a series of amplitude-modulated carrier waves along a single depth-line into tissue (A-scan), representing subsurface optical reflectivity patterns; a two dimensional display is obtained by combining many adjacent A-scan lines. Of course, the ultrasound image yields information about the mechanical / acoustic properties of tissue, whereas OCT displays a 2D map of tissue optical refractive index. There is also a fundamental difference in how the amplitude-modulated signal as a function of depth is obtained in the two methods. In

ultrasound, depth information and resolution are governed by the time-of-flight gating. Measuring the time of arrival of the train of acoustic pulses, and knowing the speed of sound in tissues, one can estimate the depth below the surface of a particular acoustic-reflecting interface. This direct way of time gating is not easy to implement in an optical imaging system because of the exceedingly fast speed of light ( $\sim$  foot / nanosecond), which would necessitate complex and expensive pulsed laser systems and optical detectors with exceptionally fast temporal resolution characteristics.

Instead, OCT relies on interferometric detection to perform depth profilometry along a given A-scan line. The most common system design is based on Michelson interferometer, as shown in Figure 1. Light from an optical source is split 50/50 by a beam splitter in a free-space OCT system (Figure 1(a)) or by a 2x2 fiber coupler in a fiber optic system (Figure 1(b)); half the light travels to the reference mirror, and half the light toward the sample to be imaged. The two returning optical fluxes recombine at the same splitter / coupler, and half of the total *reflected* light impinges on a detector.

Now imagine that the sample is a single reflective interface (same as the reference mirror), and consider the signal recorded by the photodetector as either the reference-beam splitter or the sample-beam splitter distance is varied (Figure 2). The total average intensity seen by the detector must be independent of these distance variations; however, if the light emitter is a coherent source such as a laser, the resulting pathlength difference will yield an undulation in detected intensity, superposed on a 'carrier' whose interference fringes are separated by one half of the source wavelength (recall the 1<sup>st</sup> year physics descriptions of the Michelson-Morley experiment, or the principle of operation of amplitude-modulated (AM) radio...). How far can the sample and reference arm lengths be mismatched and still exhibit an interference pattern? The answer is that the mismatch must be smaller than the coherence length of the source. This quantity varied widely; in general, the more "laser-like" the source, the longer its coherence length. For example, laser pointers and gas (e.g. HeNe) lasers, with their outstanding monochromaticity and directionality, have very long coherence lengths, ranging from several centimeters to meters. Conversely, superluminescent diodes, fluorescence emitters, and ordinary white light, with their wide spectral range and poor directionality, form interference fringes in a Michelson interferometer only within their much shorter coherence length (typically  $< 30 \mu\text{m}$ ); further lengthening of either the sample or the reference arms will not change the (steady state, or DC) intensity measured by the photodetector.

The coherence length is an all-important quantity in OCT imaging because the technique relies on low-coherence optical source. Since interference is only seen when the length of sam-

*(Continued on page 121)*



ple arm is equal to the length of reference arm (to within the coherence length of the source, which, as mentioned, can be as small several microns for a suitable optical emitter), translating the reference mirror and recording its position will indicate precisely the subsurface location of a particular reflecting feature in the sample corresponding to a particular interference fringe (Figure 2). Thus, by scanning the reference mirror, one obtains a line profile of depth-resolved sample reflectivity; repeating this process along many adjacent depth scan lines yields a two-dimensional image of tissue subsurface microstructure. Note that this coherence-gating approach has a number of practical advantages, as it eliminates the need for sophisticated pulsed-laser systems and ultrafast electronics. Instead, one can use a continuously emitting low-coherence source, such as a superluminescent diode or a broadband optical amplifier, which is generally a simple turn-key device; likewise, the demodulation of the interference fringe amplitude can be done with conventional electronics (either in hardware or in software). And because the detected interference signal is largely unaffected by multiply scattered photons that have lost their coherence characteristics (and thus do not interfere), micron-scale imaging can be performed even in opaque turbid media such as biological tissues

### Applications

The optimum biomedical applications of OCT are currently being investigated. These include early disease detection and diagnosis (e.g., spotting pre-malignant transformations in the gastrointestinal tract), pathology assessment (e.g., determining the stability / likelihood of rupture of atherosclerotic plaque), surgical guidance (e.g., subsurface imaging for micro-vessel suturing), and treatment response monitoring (e.g., examining microstructural changes in cancerous and in normal tissues throughout the course of radiation therapy). In these and other uses, the ability of OCT to generate fast high-resolution subsurface images of tissue microstructure is being exploited. Several examples from our laboratory are described below.

Figure 3 shows an OCT image of *in-vivo* human skin from an Asian volunteer, using a fiber-based OCT system with a 1300 nm center wavelength near-IR source (spectral bandwidth ~ 60 nm). The stratum corneum (top layer of skin) and the epidermal-dermal junction at ~200  $\mu\text{m}$  depth are well delineated. Other features, such as spiral sweat ducts and blood vessels, can also be detected. Encouraged by such high-resolution skin images, we are investigating the use of OCT to monitor treatment-induced changes in tissue microstructure; our first study involves radiation response monitoring of mycosis fungoides (MF) patients undergoing total skin electron irradiation.

Evaluation of vascular pathology is a very promising application of OCT, because these tissues cannot generally be biopsied. Atherosclerotic plaque, the prevalent pathology of the vascular system, is a lipid and fibrous growth that occludes the blood flow within vessels. In cardiology, it is the cause of most heart attacks. While large plaques can be imaged by conventional methods, and dealt with by suitable therapeutic procedures, it is the small ones (less than ~ 200  $\mu\text{m}$ ) that cause most problems. They can rupture, releasing fat into the blood stream that causes

clot formations and leads to myocardial infarctions. Unfortunately, these modest-sized plaques are beyond the detection limit of even the clinical technology with the highest spatial resolution (30 MHz ultrasound). A method for identifying these lesions prior to rupture, and perhaps predicting the likelihood of rupture, may significantly improve patient management.

Figure 4 shows an OCT image of *ex-vivo* vascular tissue, in this case rabbit aorta. The two dark regions within the vessel wall are the lipid pools, and the reflective layers above it are the fibrous plaque caps. As the cap becomes thinner, and/or the lipid amount increases, the risk of plaque dislodgement leading to a heart attack goes up. Since these changes are readily seen on OCT images, at least *ex-vivo*, several research groups are currently pursuing intravascular cardiology applications of OCT.

Figure 5 shows OCT images of a 15-day-old mouse embryo. Microstructural subsurface features, such as layers of the eye and blood vessels can be discerned. These types of images open the possibility for developmental biology applications. For example, one could follow progress of normal embryonic organ development over the gestation period; alternatively, one may be interested in tracking a structural alteration induced by a natural or intentional gene mutation. The noninvasive cross-sectional imaging of tissue microstructure afforded by OCT technology may be suitable for such studies.

### Evolving Frontiers

Several other areas of OCT research and development are currently under evaluation. Endoscopic OCT in the gastrointestinal tract is being investigated for early disease detection, diagnosis, and staging, for conditions ranging from Barrett's esophagus to colonic polyps. Other promising applications include early diagnosis of ocular abnormalities, and of bladder, uterine, cervix, and lung cancers.

In addition to 'conventional' high-resolution OCT imaging of tissue microstructure, it is possible to image other tissue properties to extract information of diagnostic value. Efforts in this context have resulted in several OCT imaging modes that exploit new contrast mechanisms such as polarization, flow, elasticity, and spectroscopy imaging. These offer the potential of combining structural information with dynamic, functional, or compositional assessments such as Doppler velocimetry or birefringence properties. The derived maps of these novel contrast properties are superposed on the background structural OCT images; this co-registration approach facilitates spatially-resolved assessment. For example, birefringence loss of collagen within cartilage can herald an early sign of osteoarthritis, whereas changes in blood flow dynamics may form an effective means of monitoring the progress of therapy. Since the future of diagnostic medicine likely lies with multi-modality approaches (to increase the complimentary information content and thus enable more accurate assessment), it is encouraging that OCT technology is flexible enough in itself to move in that direction.

There is also much activity on the technical and scientific frontiers of OCT methodology. More powerful and broader band

(Continued on page 122)

light sources, faster scanning techniques, novel interferometer configurations, resolution improvement schemes (particularly in the lateral direction), and optimal signal detection / image analysis methods are few of the ongoing developments that may expand the clinical use of OCT systems. The theoretical understanding of partially coherent light propagation in turbid biological media, and hence the source of contrast of OCT tissue images, is under investigation. As the history of other medical imaging modalities demonstrates, the combination of solid theoretical analysis, technological innovations, and clinical experience may eventually lead to a widespread biomedical use of OCT.

**Acknowledgements**

I would like to acknowledge the hard work and creativity of the "OCT student team" at the Ontario Cancer Institute/Princess Margaret Hospital (Victor Yang, Maggie Gordon, Alvin Mok),

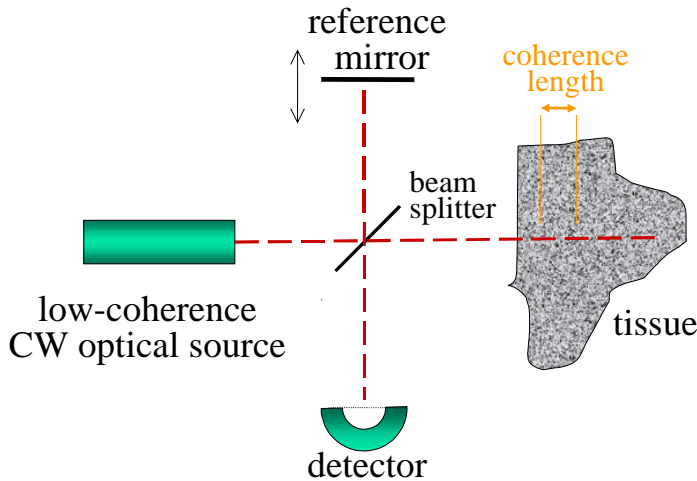


Figure 1(a). Schematic of an OCT imaging system

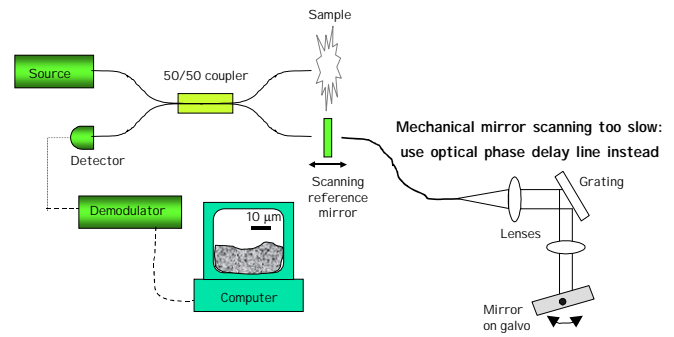


Figure 1(b). Fiber optic implementation of an OCT system

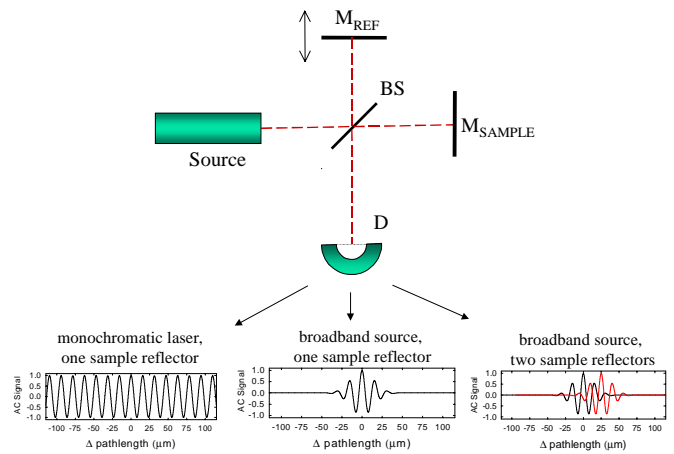


Figure 2. OCT signal generation mechanism. For the low-coherence broadband source, the coherence length (FWHM of the envelope that modulates the interference fringes) defines the depth resolution, and is inversely proportional to the source spectral width via  $\lambda_0^2 / \Delta\lambda$ , where  $\lambda_0$  is the centre wavelength.

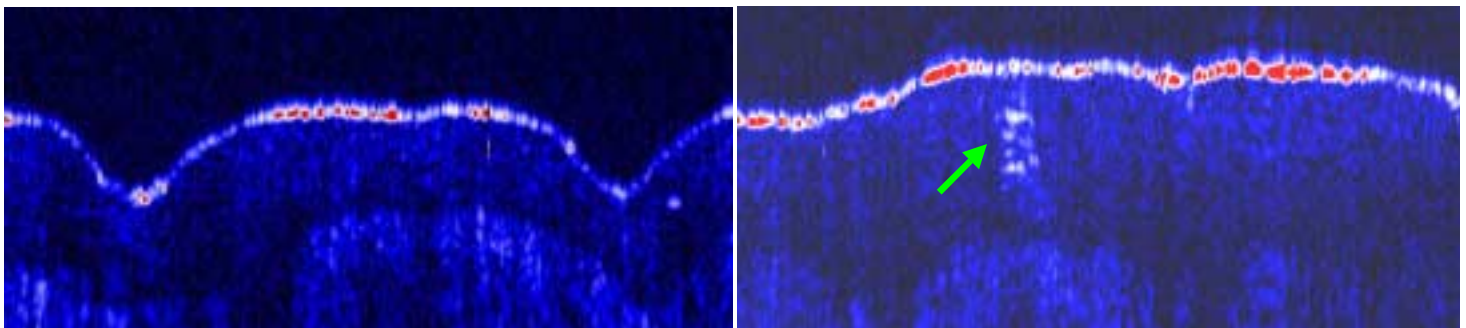


Figure 3. OCT in vivo imaging of human skin. The spiral structure indicated by the arrow is likely a sweat gland. Image size is 1 mm (lateral) by 600 μm (depth). For this and subsequent images, the colour scale represents the logarithm of detected reflectivity.

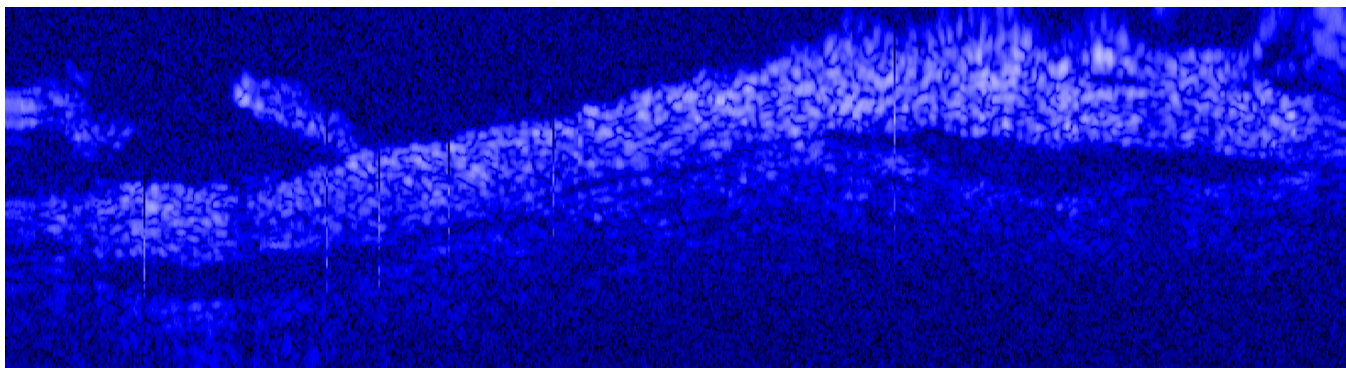


Figure 4. OCT ex-vivo imaging of atherosclerotic plaque in a rabbit artery. Field of view ~ 1.4 mm by 400  $\mu\text{m}$ .

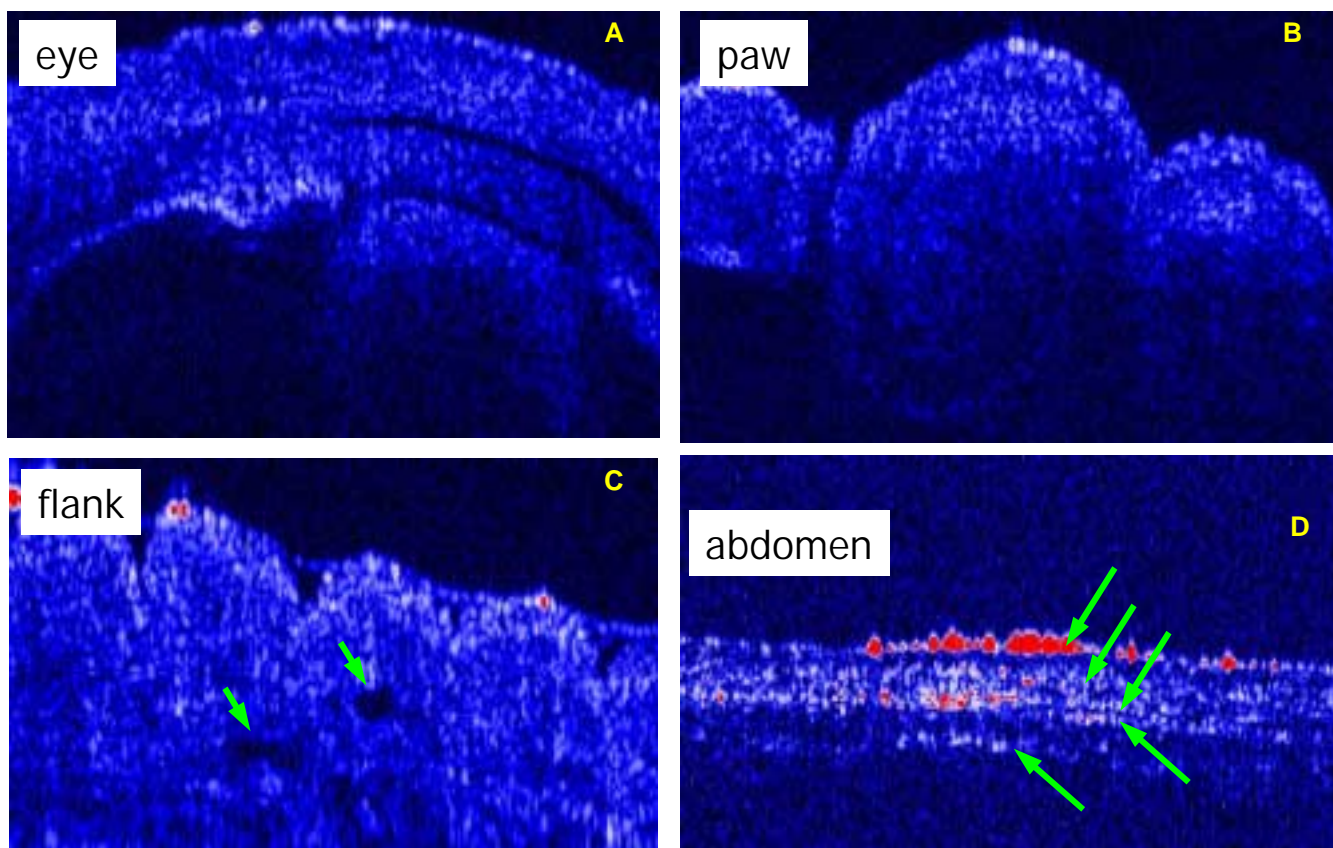


Figure 5. In vivo OCT of mouse embryo (15-days). A: The layers possibly correspond to eye-lid, cornea, and lens. B: The cross-section of 3 digits. C: two blood vessels are seen (arrows). D: Five distinctive layers can be seen. Field of view ~ 700  $\mu\text{m}$  by 600  $\mu\text{m}$  for all panels.

# COMP 47th Annual Scientific Meeting

By David Taylor

Royal Adelaide Hospital, South Australia

Will Ansbacher

Vancouver Island Cancer Centre

It was a wonderfully warm 40°C day that greeted us all in sunny Kelowna for the start of the 47<sup>th</sup> COMP/OCMP Annual Scientific Meeting in mid July. The conference was held at the Okanagan University campus, set in picturesque rolling hills just north of the city.

The first day of the conference, Thursday July 12, comprised the CCPM Symposium entitled: 'The Convergence of Biology with Medical Physics' with excellent presentations by the invited speakers. Tom Keane (BCCA) commenced the symposium with an update of advances in the world of molecular biology pertinent to radiation therapy, and offered some insight into the predicted impact of molecular biology on screening, diagnosis and treatment of cancer. It is foreseen that, in the future, pathology reports will feature individual tumour molecular profile information, that can assist the oncologist to stratify individual patients into an appropriate treatment regime based on, for example, metastatic risk, or radiosensitivity.

Calum MacAuley (BC Cancer Research Centre) informed us of the potential use of a light induced fluorescence endoscope (LIFE) to improve detection of pre-invasive high risk lesions of the lung and cervix. Using this LIFE system in combination with high resolution tissue microscopy, his group is currently assessing the efficacy of a variety of chemoprevention agents, that potentially can revert such pre-invasive lesions back to normal status.

Haishan Zeng (BC Cancer Research Centre) followed this by discussing various methods to image epithelial cancers at early stage via tissue autofluorescence. Their developments in imaging and spectroscopic systems incorporating this principle were outlined, including a fluorescence bronchoscopy system that has led to a significant improvement in detection sensitivity of lung cancer.

The presentation by Clifton Ling (Memorial Sloan Kettering Cancer Centre) on the potential of biological images for radiotherapy showed us how non-invasive biological (metabolic, physiological, functional) imaging is progressing in fields of MRI and MRS, PET and SPECT, molecular imaging and radiobiological phenotyping. In radiotherapy planning, biological in-

formation derived from these imaging modalities will ultimately assist us in deciding where dose needs to be delivered and hence in the design of the Planning Target Volume.

Jake Van Dyk (London Regional Cancer Centre) then discussed the use of biological parameters to analyse treatment plans. Examples of laboratory and clinical studies were cited to demonstrate the limitations of our current knowledge of radiobiological response. For example, the assumption that tissue responds uniformly per volume throughout an organ is challenged by results of rodent studies from PMH and MD Anderson - for the same volume of lung irradiated, basal regions of lung evoked a different response to radiation than for the apex. If true in humans, then use of DVH reduction schemes for ranking plans having different dose distributions throughout regions of lung is compromised. Until more extensive and reliable TCP and NTCP databases are built up, it is suggested that we should employ radiobiological models as a supplemental ranking tool, and strive to supply the radiation oncologist with an estimate of uncertainty in our analysis of a given treatment plan.



2001 COMP Meeting Local Arrangements Committee: Cynthia Araujo, Rasika Rajapakshe, Larry Watt, Darcy Mason and Alistair Baillie

Alex MacKay (Radiology, UBC) closed the symposium by discussing the application of MRI to distinguish between different normal and pathological states, via characterisation of T<sub>2</sub> relaxation distribution for various water compartments (myelin trapped water, intra- and extracellular water and cerebrospinal fluid) in the brain. Studies by the group demonstrated, for example, that myelin water T<sub>2</sub> signal correlates to myelin content, and so monitoring demyelination over time is possible in various neurological diseases such as multiple sclerosis and schizophrenia.

Following the AGM and dinner, the Exhibition and Poster session was conducted, with the mood very much relaxed and informal, conducive to easy discussion with the authors of some 19 posters. The posters remained on display for the duration of the conference along the entrance to the cafeteria so were well read by the conference attendees. As with the Scientific Session papers, refer to the COMP website or Conference Proceedings for a full list of titles and authors. This was also the first opportunity to visit the Commercial Exhibit, which was well frequented and appreciated by attendees at coffee and other breaks throughout the conference.

Friday was a solid and rewarding day with 34 papers of high standard presented, with all presenters using their 10 minute time slot to full effect. The first session was dedicated to Radiation Dosimetry, with papers on gel dosimetry, Monte Carlo

*(Continued on page 125)*

simulation of photon and electron linac beam energy spectra and depth dose in heterogenous phantoms, revision of ion chamber calibration factors, surface dose TLD determination, prediction of electron beam cut-out parameters and video EPID dosimetry.

The following session was the Young Investigator Symposium, having some of the conference's most stimulating and impressive work enthusiastically presented. Tamie Poepping (U.W.O. and J.P. Robarts Research Institute) took first prize with her presentation titled: "Four-dimensional ultrasound measurements in carotid artery bifurcation models". Congratulations to all authors and presenters on a rewarding symposium.

After lunch, it was the first of two Imaging Technologies sessions. Papers from both these fascinating imaging sessions embodied the CCPM Symposium theme of the convergence of biology with medical physics. Dynamic CT imaging to quantify micro-vascular architecture, quantification of stroke lesion volumes, quantitative dynamic MR imaging, blood volume changes in acute stroke, quantitative dynamic SPECT studies, optimisation of contrast agents for micro-CT angiography are but some of the 17 works presented in these sessions.

The session dedicated to Portal Imaging Physics examined the modelling of physical processes involved in signal, noise and image formation in several portal imaging systems, and a portal dose calculation algorithm that shows promise for dosimetric verification of treatment.

Fiona McNeill (McMaster University) then delivered an informative and enjoyable CAP lecture on the physical principles and application of non-invasive in vivo measurements of toxic elements such as lead, cadmium and manganese, in exposed populations. The COMP AGM finished proceedings for the day.

The Reception and Dinner that evening was held under a marquee at the Hotel Eldorado - a stunning location, attendees enjoyed fabulous food and wine whilst Ogopogo spotting from the

deck or watching water sports and the setting sun over Lake Okanagan. Many local brews were also sampled and approved by the delegates throughout the night. After the reception and award ceremony, Jean-Francois Corbett delighted us with an impromptu session on the fiddle. Then it was off back to the campus or indeed for many of us into the pulsing heart of Kelowna to continue the good times, most of the group levitating to the Splashes club. Here physicists dominated pool tables, held up entire bars and filled the dance floor, Darcy Mason leading the way. Having closed the place down, it was time to return to the campus, and read a couple of abstracts before retiring. Such a great time was had by all that several delegates actually tried the old ploy of leaving bags, proceedings etc. behind, so as to have to return to the club the following night.

Saturday was another solid day of great works. The first session on Radiation Treatment Delivery gave us presentations on ultrasound verification of prostate position, CT simulation of two-field breast treatments, commissioning aspects of virtual and micro MLCs, optimisation approaches for inverse treatment planning, a Cobalt-60 tomotherapy study, respiratory gating for breast treatments, use of DVH analysis to improve dose homogeneity, an analysis of TPR<sub>20,10</sub> as a specifier of beam quality, and an innovative linac MU odometer.

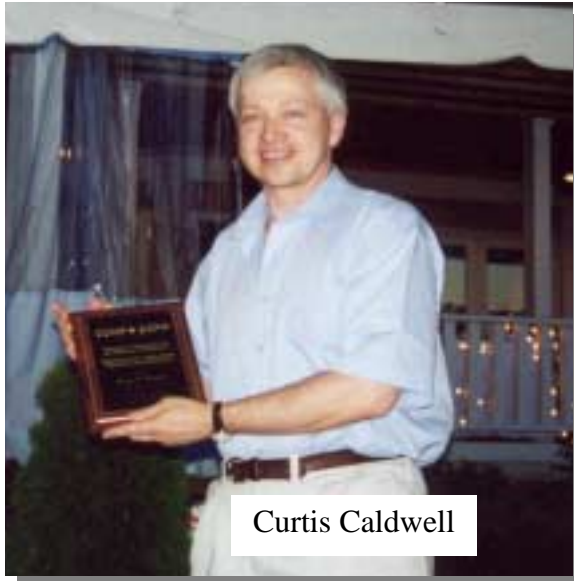
After the second Imaging session, a strong symposium on Brachytherapy and Radiation Biology finished the conference. Many presenters discussed their clinical experiences with prostate brachytherapy implants, including design aspects and appropriate selection of seeds, planning procedures and verification. The use of an inflatable endorectal HDR brachytherapy applicator was also imparted. Thought provoking talks on tolerance doses of normal tissues, and a 3D tumour growth model for simulation of radiation therapy then closed the session.

To complete the Kelowna experience, many took time to enjoy fun and sun at the beach or a winery tour before returning home. On behalf of all attendees, many thanks to the conference organisers for staging a memorable conference, and we look forward to seeing all our good friends again next time.



Ogopogo Spotting Team, preparing for another dangerous mission

# More awards from COMP ...



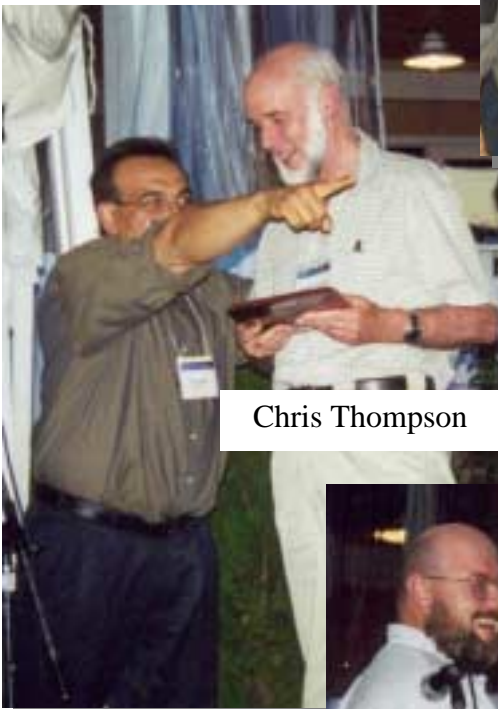
Curtis Caldwell



Paul Johns



John Aldrich



Chris Thompson



Jake Van Dyk



Peter Munro

# Pix from COMP ...



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## More pix from COMP ...



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### Video review:

## Is Radiation As Dangerous As They Say?

**John R Cameron.**

**Distributed by: Medical Physics Publishing**

**4513 Vernon Blvd. Madison, WI 53705**

**Phone: 608-262-4021, FAX: 608-262-2121, USD \$25.00**

**Review By: Pat Cadman**  
Saskatoon Cancer Centre

The package that was sent for review contained a 43 minute video lecture titled: "Is radiation As Dangerous As They Say" plus handouts. This material was initially prepared for a Medical Effects of Ionizing Radiation Course at the Armed Forces Radiobiology Research Institute in Bethesda, MD. The handouts include a hardcopy of the video presentation slides and two articles by John Cameron titled "Is radiation an essential trace energy?" and "Promoting understanding of radiation in the radiology clinic."

Dr. Cameron uses a variety of convincing examples and arguments to substantiate his thesis that moderate doses of radiation are probably beneficial. Numerous examples of an inverse relation between the amount of radiation and cancer deaths are provided, including demographic data from the USA, the British Radiologist Study and the Nuclear Shipyard Worker Study (of which Dr. Cameron was a member of the Technical Advisory Board). At the end of the lecture, Dr. Cameron proposes a hu-

man study of radiation stimulation of the immune system, which may lead to a reduction in deaths from all causes.

This is really not an information package about radiation protection and provides very little support for the standard practice of limiting radiation doses based on conservative estimates of biological effects. Quite on the contrary, Dr. Cameron is attempting to provoke us to think outside the mainstream, both as radiation specialists and patients. In closing, he introduces the concept of Background Equivalent Radiation Time (BERT) where the dose from x-rays is compared to the time to get the same dose from background. In this way, the radiographer can avoid using technical units and the patient may achieve a better understanding of the amount of radiation received and radiation phobia may be reduced.

The video production, although not high studio quality, is sufficient and Dr. Cameron's style is very down-to-earth and accessible. I think this package would go a long way to enhancing the understanding of the biological effects of radiation and provides a good counterpoint to mainstream educational material on radiation protection.



# Sylvia Fedoruk Award – 2001

In 1986, the Saskatchewan Cancer Agency established the Sylvia Fedoruk Prize in Medical Physics to honor Sylvia Fedoruk for her 35 years of dedicated and distinguished service to Saskatchewan's cancer program as a Medical Physicist.

This award is presented for the best paper on a subject falling within the field of medical physics, relating to work carried out wholly or primarily within a Canadian institution and published during the past calendar year. This is the fourteenth year the prize has been awarded.

## ***Winner:***

“Monte Carlo simulations of x-ray induced recombination in  
amorphous selenium”

J. Phys. D: Appl. Phys., 33, 1417-1423 (2000)

**M. Lachaine and B.G. Fallone**

Cross Cancer Institute, University of Alberta and McGill University

## ***Runners-up:***

“Polyvinyl alcohol-Fricke hydrogel and cryogel: Two new gel dosimetry systems”

Phys. Med. Biol., 45, 955-969 (2000)

**K.C. Chu, K.J. Jordan, J.J. Battista, J. Van Dyk, B.K. Rutt**

“Three-dimensional computed tomography reconstruction using a C-arm mounted XRRI:  
Image-based correction of gantry motion nonidealities”

Med. Phys. 27, 30-38 (2000)

**R. Fahrig and D.W. Holdsworth**

A note about the selections process:

71 papers were entered. Papers were grouped into six categories: radiation therapy (20); dosimetry and Monte Carlo (17); MRI (5); CT (7); ultrasound (14); and various subjects (8). Each category was evaluated by an expert and the best paper in each category was identified. The six winners (one from each category) were sent back to all committee members who ranked the whole group to the best of their ability.

**!!! Congratulations !!!**



## Groups and Lists

The World Wide Web gets all the attention these days. But web sites are only a subset of the internet - before web sites, newsgroups and mailing lists kept people connected. A mailing list sends individual emails to all members of the list. After subscribing, you get a detailed email on how to unsubscribe or post messages to the list. For newsgroups, you must connect with a news reader (built-in to most email applications), subscribe to the newsgroup, and view the posted messages. Alternatively, some web sites allow you to view newsgroups through a web interface (groups.google.com, for example).

### Canadian Medical Physics Mailing List

Most of you are on the Canadian mailing list (I hope). However, it is voluntary, and you will not be on it unless you have subscribed. This list is an excellent place to send job postings, or general questions to the Canadian medical physics community. It reaches many COMP members, but is not restricted to members. If you need to reach only COMP members for official COMP business, the Communications Committee has an email burster that will do the job - contact the COMP office. To subscribe to the mailing list, send an e-mail message to: [Majordomo@irus.rii.on.ca](mailto:Majordomo@irus.rii.on.ca). The subject: can be anything (it's ignored). The body of body of the message should have the single line: subscribe canada-I (that is an ell for List, not a one).

### Medical Physics Mailing List

This is a large U.S.-based site claiming over 2000 subscribers. It has a fairly high traffic (perhaps 10-20 posts a day). To subscribe, send an email to [listserv@lists.wayne.edu](mailto:listserv@lists.wayne.edu) from the email account you want to receive the list posts. The email *body* (not subject line) must include the text: subscribe medphys firstname lastname. Do not put degrees or honorifics in the name, e.g. subscribe medphys John Doe

### Linac Engineer's Mailing List

Linac-eng is a good place to get technical details on linac problems, or information about hardware, testing devices, etc. I posted a message to this list when we were having very puzzling problems with one of our linacs, and got a large number of very detailed and helpful responses.

To subscribe, send mail to [Majordomo@plato.aristotle.net](mailto:Majordomo@plato.aristotle.net) with the following command in the *body* of your email message: subscribe linac-eng <your email address>

### Canadian Mammography List

The list is at [ccpm\\_mammoqc@physics.carleton.ca](mailto:ccpm_mammoqc@physics.carleton.ca). During the next few months, contact Paul Johns ([johns@physics.carleton.ca](mailto:johns@physics.carleton.ca)) to subscribe; after that, check with the Communications Committee. This list, in place since 1995, is to facilitate communication between physicists doing clinical tests of mammo units in hospitals and clinics. Some examples of information to be shared: improvements in test methodology, novel test results, comments on testing and results for new types of clinical equipment encountered, news of changes in CAR standards or provincial regulations, requests to other physicists for advice, fees.

### yahogroups.com

The Yahoo! web portal hosts a number of groups. There are some on Monte Carlo simulations for example, and a DicomRT group.

The above list, is of course, only a sample of the newsgroups and mailing lists. The AAPM web site has a large list of relevant mailing lists (see <http://aapm.org/medphys>). If you have a favourite one related to medical physics, please email it to me for publishing in a future NetWorthy article.

Darcy Mason  
Cancer Centre for the Southern Interior  
Kelowna, BC  
[DMason@bccancer.bc.ca](mailto:DMason@bccancer.bc.ca)

## In Brief

### Welcome to the QEII Health Sciences Centre, Halifax

Three of the four vacant radiation oncology medical physics positions at the QEII Health Sciences Centre in Halifax have now been filled. We welcome ChangSeon Kim, Ph.D. (Medical College of Wisconsin), DABMP, who has come from the Korea University Medical Centre in Seoul and Mammo Yewondwossen Ph.D. (Dalhousie), MCCPM, who has been working in Halifax as a Junior Physicist. As noted in the last Interactions, Amjad Waheed, M.Sc., has filled our vacant position at the Cape Breton Cancer Centre in Sydney. We welcome our new colleagues and look forward to filling the remaining more senior position and a now vacant Junior Physicist position.

John Andrew

### COMP members gain access to career opportunities through web page

CCPM/COMP have agreed to participate in a web page called MedConnexions available through the CMA Careers section of their web site at [www.medconnexions.ca](http://www.medconnexions.ca). The purpose of this web page is to match employers in the health care field with the appropriate professionals seeking employment. We have entered into an agreement with the CMA whereby they will provide us with free registration. This article is to notify the membership according to the provisions of the Personal Information Protection and Electronic Documents Act (Bill c-6) and other provincial privacy legislation, that we will be providing the CMA with COMP/CCPM member names and addresses so that they can provide each of us with access to this service. The CMA guarantees that any identifiable member information provided by COMP/CCPM will be used solely for verification purposes. If you have any questions or concerns about the details of this agreement, I will be happy to answer.

Brenda Clark, Vice President, CCPM

## CCPM Chief Examiner's Report

July 12, 2001

By Ting Lee

### Membership Examination, March 31, 2001:

15	Candidates from 9 centres	11	Pass
12	Radiation Oncology	4	Fail
2	Diagnostic Radiology	73%	Pass
1	Nuclear Medicine		

Pass candidates: Tony Falco, Chandra Joshi, Chun-Bun Kwok, Miller MacPherson, Belal Moftah, Terence Riauka, Daniel Ricky, Daryl Scora, Eugene Wong, Wieslaw Wierzbicki, Mammo Yewondwossen

Invigilators: John Andrew, Horacio Patroncinio, David Wilkins, Andrew Kerr, John Schreiner, Katharina Sixel, Jeff Bews, Gino Fallone, David Spencer, Ting-Yim Lee

Examination Committee: Gino Fallone, Ervin Podgorsak, Peter Dunscombe, Peter Raaphorst, Jerry Battista, Rob Barnett, John Andrew, George Mawko, Ting-Yim Lee

*All successful candidates were elected Members of the College at the Annual General Meeting on July 12, 2001 in Kelowna, British Columbia*

### Fellowship Examination, July 9 to 11, 2001:

3	Pass	4	Fail
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Pass Candidates: Matthew Schmid, Ingrid Spadinger, Noel Blais

*All successful candidates were elected Fellows of the College at the Annual General Meeting on July 12, 2001 in Kelowna, British Columbia*

**On behalf of the College, I would like to congratulate the new Members and Fellowships and welcome them to the College**

!!! Congradulations to all !!!

### News from the IAEA:

It may interest Canadian medical physicists to consult the web page of the IAEA (<http://WWW.iaea.org>) and to follow the links to (<http://WWW.iaea.org/programmes/nahunet/e3/>) for the Dosimetry and Medical Radiation Physics (DMRP) section. Two projects involving Canadian medical physicists are already underway. Jake vanDyk is chairing a committee on Commissioning and QA of Computerized Radiation Treatment Planning Systems. This is a particularly relevant document given the recent incident in Panama. Ervin Podgorsak is chairing a committee to create a Syllabus on Medical Physics teaching, which we hope, will also be of general interest to all medical physicists. Certainly if you have an opportunity to visit Vienna, we would be happy to arrange for you to tour the radiation measurements and calibration facilities at the Agency's Laboratory in Seibersdorf.

Ken Shortt, Section Head of DMRP, IAEA, Vienna.

# Canadian College of Physicists in Medicine Examination Schedule 2002

## **Membership Examination:**

Applications due: 11 January 2002

Examination date: 16 March 2002

Fee: \$150.00

Decisions will be announced on February 8  
Potential fellowship candidates from those aspiring candidates will be flagged here as an assessment of their eligibility can be made from their membership applications

## **Fellowship Examination:**

Applications due: 12 April 2002

Examination date: 11, 12 or 13 July

Fee: \$200.00 2002 (in Montreal)

Decisions will be announced on May 3. and later for those who do the membership exam

Note: Those writing the membership exam on March 16 should confirm their fellowship application and pay the fee within one week of receiving the membership exam results.

For further information, application kits, and membership examination study guides, contact the Registrar, Dr. Christopher Thompson, at:

**Dr. Christopher Thompson**  
**The Registrar / Le Resistraire, CCPM**  
**c/o Montreal Neurological Institute**  
**McGill University**  
**3801 University, WB3**  
**Montreal, Quebec, H3A 2B4**

COMP Chair (*Continued from page 108*)

Our standing committees are doing well. A definition of the CCPM equivalence to the American Board has been agreed upon by COMP and the CCPM and will be posted on our Webster. Peter O'Brien's term as chair of the Radiation Regulation Committee comes to an end this year. The committee had to address extremely sensitive issues, and was able to resolve, through Peter's leadership, a large majority of these issues. I would like to extend our thanks to Peter for his expert leadership of this very important committee. We are pleased that Peter will remain with the Committee, and that Cheryl Duzenli has agreed to assume the position of Chair of the Committee from Peter for the coming year. The Communication Committee has received \$5000 budget for updating the COMP web services.

It is a pleasure to report that arrangements of the COMP participation at next year's AAPM meeting is proceeding well. COMP is considered as a chapter of the AAPM for this meeting and thus is eligible for some important privileges. We should have a Canadian night out and a Canadian designated hotel. I have been having conversation with the Chair of AAPM Scientific Committee, and although it has not been formally accepted, there will be some definite Canadian content at the AAPM meeting. We are discussing the possibility of a CCPM Symposium, a Canadian YIS, a CAP Speaker and a large number of Canadian session chairs. I hope to have more definite information on these issues in the next Interaction.

The recent tragic events in the United States have been deeply felt in Canada and in the Canadian Medical Physics

Community. We will send a combined COMP/CCPM statement to our colleagues in the US expressing our sorrow and condolences during these trying times.

B.G. Fallone, Chair of COMP  
September 16, 2001

information available on the Web. It is surprising how much work needs to be done to make sure that a document on the Web is accessible to all in a format that makes some sense. The Board is quite confident that most of the glitches in the past year are now fixed, and that our processes will be smoother in the future.

There are other issues that still require a bit of work. Recertification has been a slower process to roll out than we had thought, partly because of the work needed to make a standard set of documentation available for the members as they come to recertification. Also, while the Board had intended that members would flag themselves for recertification, it is clear that we do have to be a little more proactive in reminding folk when they are about due for recertification. This is now done and we will be reviewing documentation this fall to get the 2001 recertification completed. Actual implementation of recertification has generated questions. In our bylaws it states clearly that one requirement for certification is that the physicist applying be employed as a medical physicist involved in patient care. This statement may seem quite clear, but how it is to be interpreted is less so. I would really like to hear, or read, your thoughts on this interpretation. For example, how do you believe we should handle colleagues who in their careers turn from more clinical to more academic positions, or from obvious clinical physics to more administrative practice? How do we accommodate colleagues who play a strong and vital supportive role our community and clearly are qualified, yet perhaps do not have the direct

employment that we seem to require from our bylaws? We do not want to come into a situation where, in fulfilling our mandate to protect the Canadian public by identifying qualified medical physicists (my simple interpretation of our role), we are not recertifying qualified medical physicists. We will be seeing how these issues play out as we go through the recertification process, and they may not be as difficult as I might imagine. However, I would like to get a clear sense of your feelings on this issue.

The College would like to thank those of you have contributed to the Harold E. Johns Travel Award in the past year. This year, approximately \$800 was donated, up by about 30% from the previous year. We are very grateful for this level of support. As we prepare to renew our membership dues this Fall, we ask you all to take some time and consider supporting this award with a donation. At the same time I would like to encourage young and especially new members of the College to consider applying for this award.

I think this is a long enough message for this issue. I will bring more items for you consideration in future messages. I do encourage you to think about these items and to talk to or e-mail Board members you know. Please give us an idea on how you would like the College to proceed in its important work.

Sincerely,  
L. John Schreiner, Ph.D., FCCPM,  
Kingston, Ontario

cations for CCPM membership made after the 2002 examination.

**Process:** The examination would consist of an interview conducted by three Fellows. The duration would be about 90 minutes. The topics covered would be from the existing syllabus defined by the Membership question booklet with opportunity to question the candidate on clinical practice at their local clinic. The interview would most likely be divided into sections and categories, with a requirement to pass a requisite number of individual sections. For a pass, two of the three examiners must award marks greater than a pre-defined percentage of the scoring system. A candidate who passes the written part of the Membership examination, but fails the oral part, would not be eligible for election to the College. However, the candidate would not have to resit the written examination before re-attempting the oral examination.

**Budget:** If the examinations are conducted immediately prior to either the annual meeting or a mid-year board meeting, the costs incurred will consist of accommodation and meals for the examiners plus a room rental. Three or four candidates could be examined per day per three examiners with an estimated maximum cost of \$1,000. Thus, to ensure self financing, the additional cost to the candidate will be of the order of \$250 over the current Membership application price. For comparison, the Fellowship examination requires 6-8 examiners at a cost in excess of \$350 per candidate.

**Sample Question:** What do you understand by the term ALARA?

**Answer:** As Low As Reasonably Achievable (5/10 Marks)

Which refers to restricting radiation doses to occupationally exposed workers and the general public to a minimum while maintaining efficacy of test/procedure/shielding, economic and social factors taken into account. (remaining 5 Marks).

# CORPORATE MEMBERS

<p><b>ADAC Laboratories</b> 540 Alder Drive Milpitas CA 95035 Phone: (408) 321-9100 3971 Fax: (408) 577-0907 Website: www.adaclabs.com</p> <p><i>Contact: Mr Harry Tschopik mailto:tschopik@adaclabs.com</i></p>	<p><b>Best Medical International</b> 7643 Fullerton Road Springfield VA 22153 Phone: (703) 451-2378 104 Fax: (703) 451-8421 Website: www.best-medical.com</p> <p><i>Contact: Mr Krishnan Suthanthiran mailto:krish@best-medical.com</i></p>	<p><b>Canadian Scientific Products</b> 1055 Sarnia Road, Unit B2 London ON N6H 5J9 Phone: (800) 265-3460 Fax: (519) 473-2585 Website: www.csp2000.com</p> <p><i>Contact: Mr Steve Gensens mailto:sgensens@cspmedical.com</i></p>	<p><b>CNMC Company Inc.</b> 2817-B Lebanon Pike Nashville TN 37214 Phone: (615) 391-3076 Fax: (615) 885-0285 Website: www.cnmcco.com</p> <p><i>Contact: Mr Ferd Pustl mailto:CNMCsales@earthlink.net</i></p>
<p><b>Donaldson Marphil</b> 3465 Cote des Neiges #602 Montréal QC H3H 1T7 Phone: (514) 931-0606 Fax: (514) 931-5554 Website:</p> <p><i>Contact: M. Michel Donaldson mailto:donaldson.marphil@qc.aibn.com</i></p>	<p><b>DRAXIMAGE Inc</b> 16751 Trans-Canada Hwy Kirkland QC H9H 4J4 Phone: 1-888-633-5343 Fax: (514) 630-7201 Website: www.draximage.com</p> <p><i>Contact: Mr Brian McMaster mailto:bmcmaster@draximage.com</i></p>	<p><b>Elekta Oncology Systems Inc.</b> 3155 Northwoods Parkway Norcross GA 30071 Phone: (770) 300-9725 Fax: (770) 448-6338 Website: www.elekta.com</p> <p><i>Contact: Ms Wendy Hornby mailto:Wendy.Hornby@elekta.com</i></p>	<p><b>GE Medical Systems Canada</b> 2300 Meadowvale Boulevard Mississauga ON L5N 5P9 Phone: (905) 567-2171 Fax: (905) 567-2115 Website: www.ge.com/medical</p> <p><i>Contact: Ms Heather Phillips mailto:heather.phillips@med.ge.com</i></p>
<p><b>Harpell Associates Inc.</b> 1272 Speers Rd, Unit 2 Oakville ON L6L 2X4 Phone: (905) 825-2588 Fax: (905) 825-0234 Website: www.harpellassociates.com</p> <p><i>Contact: Mr David Harpell, P.Eng. mailto:David@harpellassociates.com</i></p>	<p><b>Hilferdine Scientific Inc.</b> 85 Denzil Doyle Court Kanata ON K2M 2G8 Phone: (613) 591-5220 Fax: (613) 591-0713 Website: www3.sympatico.ca/hilferdine</p> <p><i>Contact: Mr Sean Eckford mailto:hilferdine@sympatico.ca</i></p>	<p><b>Kodak Canada Inc.</b> 3500 Eglinton Ave W Toronto ON M6M 1V3 Phone: (416) 766-8233 Fax: (416) 760-4487 Website: www.kodak.ca</p> <p><i>Contact: Mr Bob Gollaher mailto:gollaher@kodak.com</i></p>	<p><b>Landauer, Inc.</b> 2 Science Road Glenwood IL 60425 Phone: (708) 755-7000 Fax: (708) 755-7016 Website: www.landauerinc.com</p> <p><i>Contact: Mr William Megale mailto:sales@landauerinc.com</i></p>
<p><b>LAP of America</b> 1755 Avenida Del Sol Boca Raton FL 33432 Phone: (561) 416-9250 Fax: (561) 416-9263 Website: www.lap-Laser.com</p> <p><i>Contact: Mr Trent Van Arkel mailto:tava@lap-laser.com</i></p>	<p><b>MDS Nordion</b> 447 March Road Kanata ON K2K 1X8 Phone: (800) 465-3666 2276 Fax: (613) 591-3705 Website: www.mds.nordion.com</p> <p><i>Contact: Mr Peter D'Amico mailto:pdamico@mds.nordion.com</i></p>	<p><b>Mentor Medical Systems Canada</b> 1333 Boundary Rd, Unit 10 Oshawa ON L1J 6Z7 Phone: (800) 668-6069 Fax: (905) 725-7340 Website: www.mentorcanada.com</p> <p><i>Contact: Mr Norm LeRoux mailto:nleroux@mentorcanada.com</i></p>	<p><b>Modus Medical Devices Inc</b> 17 Masonville Crescent London ON N5X 3T1 Phone: (519) 438-2409 Fax: Website: www.modusmed.com</p> <p><i>Contact: Mr John Miller mailto:jmiller@modusmed.com</i></p>
<p><b>Nucletron Corporation</b> 7080 Columbia Gateway Drive Columbia MD 21046 Phone: (410) 312-4127 Fax: (410) 312-4126 Website: www.nucletron.com</p> <p><i>Contact: Ms Nina Yerge mailto:yerge@nucusa.com</i></p>	<p><b>PTW-New York Corporation</b> 201 Park Avenue Hicksville NY 11801 Phone: (516) 827-3181 Fax: (516) 827-3184 Website: www.ptwny.com</p> <p><i>Contact: Mr Steve Szeglin mailto:ptw@ptwny.com</i></p>	<p><b>Scanditronix Wellhofer North America Inc.</b> 3150 Stage Post Drive, Ste 110 Bartlett TN 38133 Phone: (901) 386-2242 Fax: (901) 382-9453 Website: www.wellhofer.com</p> <p><i>Contact: Mr Dan Roberts mailto:droberts@swna.org</i></p>	<p><b>Siemens Electric Ltd.</b> 2185 Derry Road West Mississauga ON L5N 7A6 Phone: (905) 819-5747 Fax: (905) 819-5884 Website: www.siemens.ca</p> <p><i>Contact: M. Dean Willems mailto:dean.willems@siemens.ca</i></p>
<p><b>Thomson Nielsen</b> 25B Northside Road Ottawa ON K2H 8S1 Phone: (613) 596-4563 Fax: (613) 596-5243 Website: www.thomson-elec.com</p> <p><i>Contact: Ms Mairi Miller mailto:mmiller@thomson-elec.com</i></p>	<p><b>Varian Medical Systems</b> 3100 Hansen Way, M/S MGM Palo Alto CA 94304-1038 Phone: (650) 424-6650 Fax: (650) 493-5637 Website: www.varian.com</p> <p><i>Contact: Ms Jan Roth mailto:JRoth@os.varian.com</i></p>		

# Princess Margaret Hospital CANCER CARE ONTARIO

Cancer Care Ontario operates nine regional cancer centres in Ontario, with 4 new centres scheduled to open between 2003 and 2005. Our work includes programs in cancer prevention, screening, treatment (medical, surgical and radiation), supportive care, research, education and the development of treatment guidelines.

Cancer Care Ontario is the province's leader in the integration and coordination of cancer control services, and the Ministry of Health and Long-term Care's principal adviser on cancer issues.



## EXPLORE THE FUTURE IN CANADA

Cancer Care Ontario's nine regional cancer centres and the Princess Margaret Hospital are currently recruiting qualified Medical/Clinical Physicists to join their multidisciplinary radiation program teams.

Located in Ontario, Canada's largest province with a population of over 10 million, the ten centres are equipped to support modern 3D radiation treatment planning, high energy photon and electron radiation treatment and LDR and HDR brachytherapy. Several regional cancer centres and the Princess Margaret Hospital have virtual simulation capability and perform stereotactic radiosurgery, I-125 brachytherapy, total body irradiation, and IMRT.

### **Cancer Care Ontario**

Cancer Care Ontario's nine regional cancer centres are the foundation of one of the world's largest cancer treatment, research, and education organization. The centres are located in Ontario's major regional centres - Toronto, Hamilton, Kitchener, London, Windsor, Kingston, Ottawa, Sudbury, and Thunder Bay. Four additional centres in Mississauga, Oshawa, St. Catharines and Sault Ste. Marie are expected to open starting in 2003.

### **Princess Margaret Hospital (part of the University Health Network)**

Princess Margaret Hospital is Canada's largest teaching hospital and research facility exclusively devoted to cancer treatment, research and education. The hospital houses 14 linear accelerators and 3 cobalt 60 units, as well as 3D treatment planning and simulation facilities.

Ontario centres have been pioneers in the development of new radiation sources, digital portal imaging systems, tools for radiosurgery, and dose calculation algorithms for 3D treatment planning now used on computer systems worldwide. Some centres are involved with laser photodynamic therapy and radiobiology research programs.

### **MEDICAL/CLINICAL PHYSICISTS**

Medical/Clinical Physicists are eligible for academic appointments with affiliated universities and are active participants in clinical training programs.

Successful candidates will have a MSc or PhD (preferred) in medical physics or a related discipline from a recognized university, at least two years of clinical experience and membership or eligibility for membership in the Canadian College of Physicists in Medicine (CCPM). A proven record of productivity in research or clinical development activity will be a definite asset.

Cancer Care Ontario and Princess Margaret Hospital offer outstanding compensation and benefit packages, including comprehensive health care. In addition, successful candidates will be reimbursed relocation expenses according to policy.

Please submit curriculum vitae to:

**Manager, Radiation Treatment Program Recruitment,  
Cancer Care Ontario & Princess Margaret Hospital,  
620 University Avenue, 15th Floor, Toronto, ON,  
Canada M5G 2L7. Fax: 1-416-971-5400. E-mail:  
provincial.human.resources@cancercare.on.ca**

**[www.cancercare.on.ca](http://www.cancercare.on.ca)**

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## Job Opportunity

MDX Medical Inc.  
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MDX Medical is dynamic new company that is in the business of developing and commercializing medical device technologies emanating from Universities, hospitals, and other research institutions.

MDX holds a Master Agreement with the University of British Columbia that provides an exclusive first look at new medical device-related technologies originating from UBC and its affiliated hospitals and agencies. These hospitals include: Vancouver General Hospital, BC Children's Hospital, BC Women's Hospital and Health Center, St. Paul's Hospital, UBC Hospital and certain BC Cancer Agency technologies.

The company is in search of a Medical Physicist to add to its medical device development team. The initial focus will be the development of the company's Film Phantom Verification System for stereotactic radiosurgery/radiotherapy. The selected individual will test and develop final prototype with senior engineer and medical physicist at the BC Cancer Agency.

This position provides a unique opportunity for medical physicists interested in commercial development of medical devices. The company will provide stock option incentives, significant growth potential and comparable salary commensurate with education and experience.

Position: Medical Physicist

Requirements: M.Sc. Medical Physics or related field  
Programming experience in C, C++ (preferred)  
Project management experience (preferred)  
Medical device development experience (preferred)

Please send resumes by mail, fax or email to:

Rupinder Bagri  
MDX Medical Inc.  
Jack Bell Research Center  
535-2660 Oak St.  
Vancouver BC V6H 3Z6

Fax: 604-875-5390

Email: [rbagri@mdxmedical.com](mailto:rbagri@mdxmedical.com)

For more information please call: 604-875-4529





## Regina Health District

The Regina Health District, a client centred organization, committed to developing a healthy community requires a Permanent Full-Time:

### Medical Physicist, Nuclear Medicine

The Regina Health District delivers client-centred health care through an integrated system of two acute care hospitals, a rehabilitation centre and numerous community health centres and services. This dynamic organization is the tertiary referral centre for southern Saskatchewan.

As the **Medical Physicist, Nuclear Medicine**, you will be accountable for the provision of physics consultant services towards efficient and effective Nuclear Medicine operations within the Regina Health District at the two acute care sites. This includes all matters relating to radiation safety, nuclear medicine physics, computers (software & hardware), diagnostic equipment, instrumentation, CNSC regulatory matters, and troubleshooting.

The successful candidate will have a Ph.D. in Physics or Medical Physics with some postdoctoral experience; a suitable combination of education and experience will also be considered. As well, certification by the Canadian College of Physicists in Medicine is desirable. The ideal candidate must articulate theory and knowledge related to Nuclear Medicine imaging systems, computer systems, and diagnostic equipment. Excellent interpersonal, communication, time management and problem solving skills are a must.

The Nuclear Medicine department is a dynamic environment where you play a key role in the quality of patient care.

The Regina Health District offers competitive salaries commensurate with education and experience levels, as well as relocation assistance and a full range of benefits. If you are interested in exploring this exciting opportunity....

Deadline October 31, 2001

Human Resources  
Regina Health District  
Wascana Rehab Centre  
2180 23<sup>rd</sup> Avenue  
Regina, Saskatchewan  
S4S 0A5

**FAX: 766-5147**

Email: [jobs@reginahealth.sk.ca](mailto:jobs@reginahealth.sk.ca)  
Website: [www.reginahealth.sk.ca](http://www.reginahealth.sk.ca)

or

Toll Free: 1-877-RHD-CALL  
(1-877-743-2255)

The Regina Health District thanks all applicants for their interest, however, only those applicants considered for interviews will be contacted.

## IMAGING SCIENTIST

Applicants are being sought for an Imaging Scientist to join the team at the Brain-Body Institute, St. Joseph's Healthcare, Hamilton, and McMaster University. Academic rank will be at the Assistant or Associate Professor level, depending on qualifications and previous experience in the field. The anticipated start date for the position is January 2002.

Candidates must preferentially have a doctorate degree in physics, mathematics, statistics, psychology, or a closely-related discipline, and at least two years of post-doctoral experience in medical imaging. Direct experience in aspects of PET and MRI instrumentation, as well as functional neuroanatomy and neurophysiology are essential. Experience in tomographic reconstruction algorithms, scanner performance evaluation, tracer kinetic modelling, image quality assessment, activation study design and analysis, would be assets. Evidence of independent research productivity is also important.

Interested and qualified applicants are invited to submit a detailed curriculum vitae, together with a statement of research interests and letters from three referees by October 31, 2001 to:

Dr. Claude Nahmias  
*Brain Body Institute*  
*St. Joseph's Healthcare, Hamilton*  
*FSORC, H304, Martha Wing*  
*50 Charlton Avenue East*  
*Hamilton, ON, L8N 4A6*

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