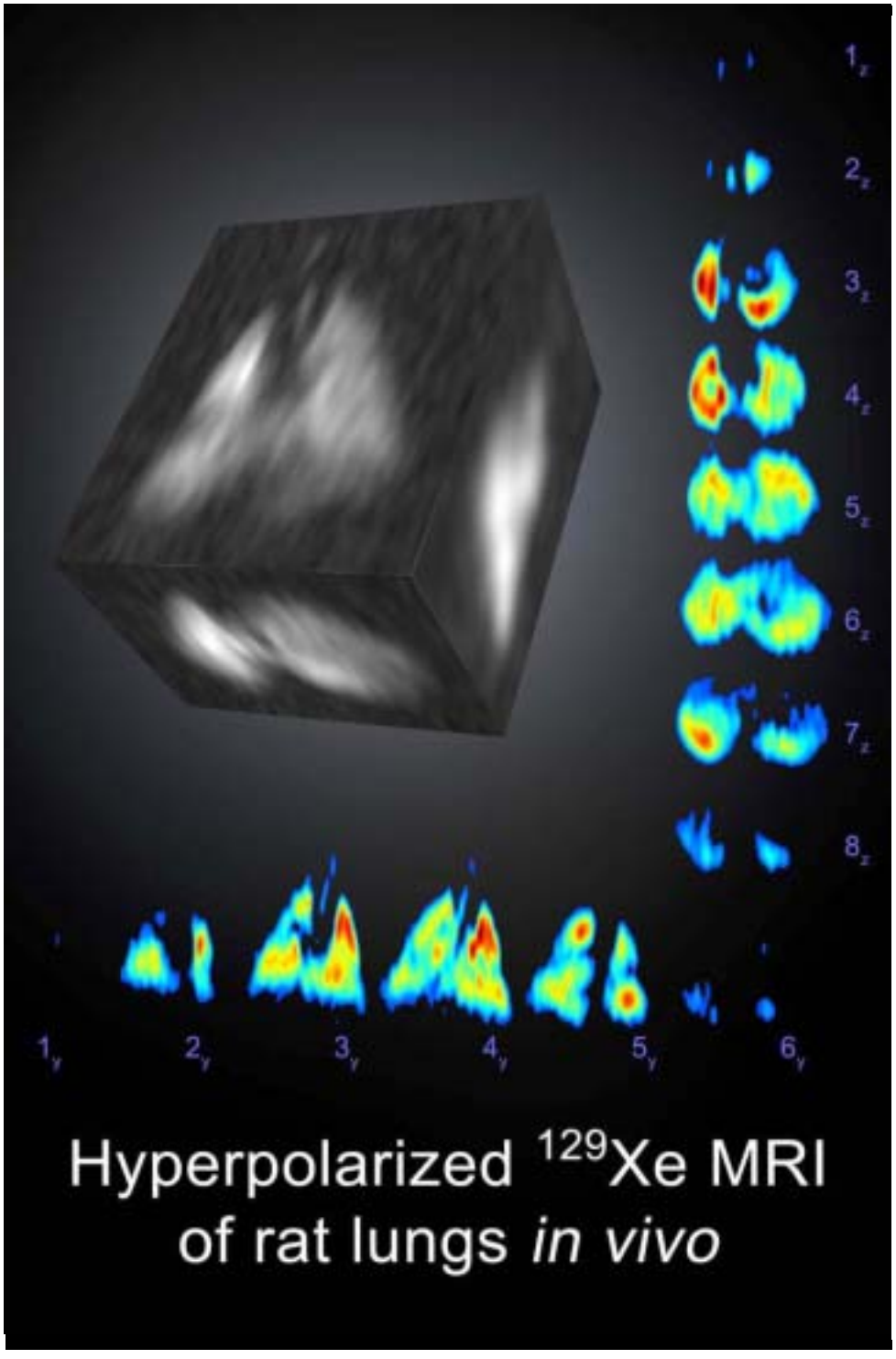
InterACTIONS

CANADIAN MEDICAL PHYSICS NEWSLETTER
Le BULLETIN CANADIEN de PHYSIQUE MÉDICALE



COMP OCPM

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CANADIAN COLLEGE OF PHYSICISTS IN MEDICINE

LE COLLÈGE CANADIEN DES PHYSICIENS EN MÉDECINE

50 (3) juillet/July 2004

About our Cover

The development of spin-exchange optical pumping, and subsequently hyperpolarized ^{3}He and ^{129}Xe has made it possible to image gas spaces in the body as well as provide functional lung information using MRI. The CMRF has been investigating the possible applications of hyperpolarized ^{129}Xe (HXe) to both MRI ventilation studies and NMR spectroscopy of HXe dissolved in the blood. The cover picture shows three orthogonal maximum intensity projections of the lungs of a living rat imaged during a single breath hold of HXe gas, accompanied by the relevant slices shown along two orthogonal axes. Data were acquired at 1.89 T using a 30 cm bore Magnex magnet and a quadrature RF coil tuned to 22.18 MHz, controlled by a MRRS MR5000 console. A 3D variable tip angle gradient echo sequence was used to acquire a 64×16×16 matrix with a 100×100×100 mm field of view in approximately 6 seconds, and zero-filled to produce the images shown. The image shows the structure of normally ventilated rat lungs including the trachea (slices 1_z, 2_z, 3_y and 4_y), the left and right lungs, and the location of the heart (slices 3_z, 4_z, 2_y and 3_y). This image was taken as part of an absolute lung-volumetry study. This work is sponsored by NSERC and the Ontario Research and Development Challenge Fund.

Images provided by Steven White, Nishard Abdeen, and Giles Santyr, Carleton Magnetic Research Facility, Dept. of Physics, Carleton University, Ottawa, Ontario.

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, images, and 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.

Corporate advertising enquiries can be made (until a new Executive Director is found) to:
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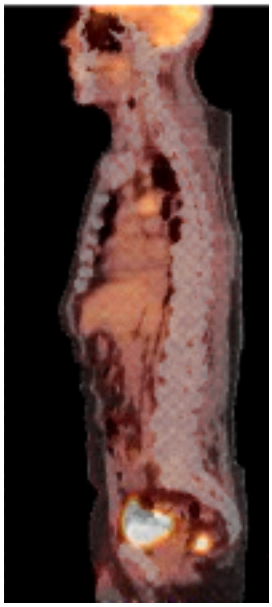
Job Advertising Options

OPTION 1 ($200): Job posting on COMP/CCPM website only (updated monthly)
OPTION 2 ($300): Job posting on COMP/CCPM website AND in InterACTIONS! (single page)
OPTION 3 ($300): Job posting is immediately e-mailed to COMP/CCPM members (no website or InterACTIONS! posting)

Regular Advertising

	1/2 page	1 page	Addn. pages
Member Announcement		$100	$100
Corporate Member	$150	$200	$100
Non Profit Organisation	$225	$300	$125
Corporate Non-Member	$300	$400	$200
Color	Add $400 (when available)		

Inter**ACTIONS** 50 (3) juillet/July 2004



Inside this issue:

Radiation Oncology Planning with a PET/CT Simulator….. 91
Kathy Mah, Curtis Caldwell, and Parminder Basran

Message From the COMP Chair – **Clément Arsenault**	80
Message From the CCPM President – **Brenda Clark**	81
Minutes of the COMP Annual General Meeting — **Alanah Bergman**	82
HE Johns Travel Award — Wayne Beckham	87
Workshop on Alternatives to Mammography — Announcement	87
COMP Treasurer's Report — **Horatio Patrocinio**	88
In Brief	89
Medical Physics Research a Hit with Oscar — **Michael Patterson**	96
AQPMC 2004 — **Michael Evans**	97
Chinese Radiation Oncology — **Peter Munro**	98
MedConnexions.ca — **Announcement**	99
IAEA Creates PACT Fundraising Fund to Fight Cancer — **Ken Shortt**	99
3rd Joint Brachtherapy Meeting — **Luc Beaulieu**	100
From the Editor — **Boyd McCurdy**	100
CCPM Chief Examiner's Report 2004 — **Katharina Sixel**	101
CMA-CCA 2004 — **Michael Evans**	102
Accreditation: An Idea Whose Time has Come? — **Brenda Clark, Ed McCullogh**	103
ICCR 2004 — **Michael Sharpe**	104
"Top 40 under 40" List Includes David Jaffray — **Michael Sharpe**	104
Corporate Members	105
Advertising	95, 106-112

Message from the COMP Chair:

...our biggest accomplishment was the development of our new website. I firmly believe that this will be a significant improvement to the services we provide our members and will be the stepping-stone to many new services.

Well, my last message as Chair! Actually, I am writing this as Past-Chair since this issue of InterActions is coming out after our AGM. But since I signed on to do 8 of these, I still have one more to do. It's amazing how quickly two years passes by!

Our Annual Scientific Meeting was held a few weeks ago in Winnipeg with the CAP, CASCA and BSC. With over 660 attendees, I believe all organizations agree that the meeting was a tremendous success. Several initiatives from CAP and CASCA were new to many of us. In particular, what impressed our COMP members were the Herzberg Memorial Public Lecture, invited speakers within sessions of contributed talks, and press conferences to announce major discoveries. I heard several comments that such activities should be attempted in our stand-alone meetings. What better way to raise the profile of our profession! So, don't be surprised if you see some of these activities appear in our next meeting.

The Local Arrangements group, which included staff from the University of Manitoba and the Physics Department of CancerCare Manitoba, did a wonderful job in keeping the meeting running smoothly. My most sincere thanks to Stephen Pistorius and his Administrative Officer, Sherri Wood, for keeping a close eye on all of COMP's needs during the 5 days we were in Winnipeg. I know that Stephen deserves every minute of the vacations he took immediately following the meeting. Congratulations on a job well done!

During the AGM, a few important motions were passed. The members present agreed to lower the registration fees for retired members from 70$ to 20$ and to waive the fees for Emeritus members. I think these are excellent gestures to recognize the important contributions these individuals brought to our profession. Secondly, our Election process was changed slightly to account for the situation of a single nominee to an Executive position. This Bylaw change appeared in the previous issue of InterACTIONS!.

We also said good-bye to a few members of our Executive. A very special thanks to both Gino Fallone and Alanah Bergman, whose terms ended this year. Gino has been on the Executive for 6 years now as Chair-Elect, Chair, and Past Chair. He certainly brought life to our meetings and we thank him sincerely for all the work he has done for our organization. Alanah finished her term as Secretary of COMP and her typing skills will be a hard act to follow for our new Secretary! Thanks Alanah. It was a pleasure working with you. Our new Chair-Elect and our new Secretary were voted in by acclamation during the AGM. Stephen Pistorius (from Winnipeg of course) has graciously accepted to take on the duties of Chair-Elect while Will Ansbacher from Victoria will be our new Secretary. Thanks to both of you for accepting these important positions within our Executive.

Dr. Clément Arsenault, COMP Chair

In reviewing my two-year term as Chair, I think our biggest accomplishment was the development of our new website. I firmly believe that this will be a significant improvement to the services we provide our members and will be the stepping-stone to many new services. I encourage all of you to visit this site frequently and to help our Communications Committee keep this a very dynamic and informative site.

And finally, I would personally like to thank all those who helped me during my term as Chair, especially the members of the Executive who were understanding and helpful over the last few months. I am looking forward to working with you for the next two years as Past-Chair. My main role will be as Chair of the Nominations Committee. So, if you have not yet served on the executive, I hope you will accept my invitation when I come knocking on your door! As a previous Chair said so well, "I'm out of here!".

Message from the CCPM President:

The CCPM Annual General Meeting was held in Winnipeg on 13 June and this year we welcomed one new Fellow, ***Giles Santyr***, and 12 new Members, ***Parminder Basran, Slobodan Devic, Robert Doucet, Keith Furutani, Robert Hunter, Ian Kay, Kyle Malkoske, Boyd McCurdy, Siobhan Ozard, James Scott, Michael Tassotto*** and ***Collins Yeboah***. In his welcoming address, Mike Bronskill as the most 'senior' Fellow present, congratulated these individuals and reminded us all of the significant achievement represented by this milestone. The Chief Examiner's report later in this edition gives a full review of this year's examination process.

Dr. Brenda Clark, CCPM President

For the first time this year, an oral was added to the membership examination. While the two imaging candidates were examined in Winnipeg immediately prior to the scientific meeting, for logistical reasons the 14 therapy examinations were scheduled separately at the Toronto-Sunnybrook Regional Cancer Centre on 29 May. Each candidate was asked 15 questions during a 1.5 hour period, the imaging candidates facing a single 3 examiner panel and the therapy candidates moving between three pairs of examiners each asking 5 questions to facilitate a one day schedule. The examiners meeting held after the therapy sessions in Toronto identified that candidates who found the questions difficult to answer would have been better prepared had they had more clinical experience and a clearer approach to technical problem solving - skills also usually derived from increased experience. While the successful candidates had not necessarily experienced exactly the scenarios described by the questions, they demonstrated sufficient ability to 'think on their feet' and were able to respond in a coherent and structured way to the questions posed. The questions were designed to be of the type that may be encountered in a clinical setting. The pass rate for this oral component was unfortunately less than 100%, serving to confirm the rationale for this addition.

The bad news however is that as a result of the introduction of membership oral examinations, we are obliged to increase the fee. We are required to run our examinations on a cost-neutral basis and the addition of the oral examination has increased our costs considerably. The new application fees for membership and fellowship are $450 and $300 respectively, approved by a vote of those members present at the AGM. Membership candidates who fail the written examination and are thus ineligible for the oral examination will receive a refund of $300.

The winner of this year's ***Harold E. Johns Travel Award for Young Investigators*** is ***Michelle Hilts*** and we look forward to reading about her trip to DOSGEL 2004 in a future edition of Interactions. I encourage all our younger colleagues to consider applying for this award, details of which are described on the web page.

We have two board members who have reached the end of their 'sentence' and on behalf of the board, I extend thanks to them both for their diligent service to the organisation. ***George Mawko***, having honed his financial skills serving as our secretary/treasurer for 5 years, has recently been appointed treasurer of IOMP and we wish him well with this task. ***John Schreiner*** has served 3 years as president and 4 as vice president and been responsible for strenthening several areas of activity including mammography accreditation. One of his initiatives was the formal recognition of service to both our organisations with a very fine plaque. ***Dick Drost*** is moving into the position of Vice President vacated by John. I welcome ***Michael Evans*** and ***John Andrew*** who were elected to the Board to fill the empty places and look forward to working with them over the next few years.

As usual, I will close by reiterating that we are always keen to receive your input. Please do not hesitate to contact any of the board members at any time with suggestions or comments.

For the first time this year, an oral was added to the membership examination.

COMP ANNUAL GENERAL MEETING — Minutes
Winnipeg, Manitoba
June 15, 2004

Chair: Clément Arsenault
Secretary: Alanah Bergman

Meeting called to order by C.Arsenault: 5:03 PM
38 full members present. Quorum met (minimum needed: 36 members)

1. **Adoption of the Agenda:**
Motion to adopt agenda of COMP 2004 AGM : P.McGhee ***Second****:* N.Sidhu ***Vote:*** Carried.

2. **Minutes of COMP June 6, 2003 AGM (Edmonton, AB):**
Motion to accept the minutes from the June 6, 2003 COMP AGM: W.Beckham ***Second:*** H.Patrocinio ***Vote:*** Carried.

3. **Business Arising from the Minutes:**
No business arising.

4. **Report from the COMP Chair:** (C.Arsenault)

i) Endorsement

COMP asked to 'endorse' several educational activities this year:
a) IAEA handbook for radiation therapy physics – much content written by physicists from McGill University. Handbook sent to several organizations for approval/endorsement. COMP/CCPM asked to review and comment. COMP agreed to have logo appear on booklet.
b) DosGel 2004 meeting (Gent, Belgium)
c) Monte Carlo Planning Workshop (McGill University, Montreal, PQ)
Discussion at COMP Executive meeting re: legal implications of endorsement. Will develop a clear policy with consultation with a lawyer. Until that time, COMP will refuse future 'endorsements'.
ACTION: Chair to circulate draft policy, when available, to membership for comment.

ii) Awards Committee
New committee chair appointed. J.P. Bissonnette has replaced J.Schreiner. COMP Chair thanked J.Schreiner for his service.

iii) Sylvia Fedoruk Award
Feedback from 2003 Sylvia Fedoruk Award Committee indicated that current process is onerous and requested that the award selection process be reviewed. COMP Awards Committee asked to review process and report back to Executive. Note article in InterACTIONS! addressing this issue from member M.Patterson. If changes to be made, probably will not occur before 2006.

iv) COMP Representation
IOMP ***(International Organization of Medical Physics)*** - COMP asked to name representative to International Advisory Committee (IAC). IAC promotes medical physics in developing countries. J. Van Dyk has agreed to represent COMP and will report to Executive annually.

CSNM ***(Canadian Society of Nuclear Medicine)*** **-** Reminded by Karen Gulenchyn that COMP is a founding society thus part of its role is to name a member to the Board. This has not been done in the past. Previously COMP has appointed 'chair' to the Technical Standards Committee. CSNM recommended C.Webber (Nuclear Medicine, Hamilton, ON). COMP Executive agreed. Will be asked to submit an annual report.

v) MRI Safety Code
CAMRT/CAR ***(Canadian Association of Medical Radiation Technologists / Canadian Association of Radiologists)*** have started an initiative to request that the federal Minister of Health review and update Safety Code 26 (published 1987). Executive has requested a volunteer MRI physicist to review document and make recommendations. D.Drost will review Safety Code and solicit comments from colleagues. Questions to answer: Is there a problem with Safety Code 26? Should COMP participate in initiative? COMP Executive should be able to respond in a few weeks.

vi) COMP/CCPM – Committee Structure
Many committees are joint COMP/CCPM committees. Identified a need to reinforce that COMP and CCPM are 2 organizations with 2 distinct goals. Agreed to change committee reporting scheme: Professional Affairs Committee (PAC) and Radiation Safety and Technical Standards Advisory Committee (RSTSAC) will now report directly to COMP Executive. Finance, Conference and Communication Committees will remain as joint CCPM/COMP committees.

vii) Executive Director
M.Henry resigned April 2004 citing time commitment issues. COMP/CCPM reviewing job description. Job advertisement to be posted and hope-

(Continued on page 83)

fully position can be filled before November, 2004. Upcoming COMP Treasurer's report reflects a position offering more than 1 day/week. Anticipated that a 2-3 days/week position will increase impact.

viii) Secretariat
B.Callaghan's contract expires end of August, 2004. COMP Executive will renew contract 1 year if she is willing to continue

5. Report from the CCPM President: (B.Clark)
i) Membership - FCCPM (1 new Fellow) : G.Santyr MCCPM (12 new Members): Parminder Basran, Slobodan Devic, Robert Doucet, Keith Furutani, Robert Hunter, Ian Kay, Kyle Malkoske, Boyd McCurdy, Siobhan Ozard, James Scott, Michael Tassotto, Collins Yeboah

ii) Emeritus Category - CCPM membership voted to remove emeritus category. Current emeritus members will retain status (6 members), but no new members will be nominated. Felt that it would be more appropriate for COMP to recognize service to the profession of medical physics. Mechanism already in place.

iii) MCCPM Examination - Oral exam implemented.

iv) Examination Fees - Fees increased at CCPM AGM. Fees intend to keep exams cost neutral.
Membership: $150 increased to Ą $450. Fellowship: $200 increased to Ą $300.

v) Recertification – All but one eligible member recertified in 2003/2004. One member declined re-certification due to retirement.

vi) Harold E. Johns Award – 2004 award to Michelle Hilts (Vancouver, BC). Funding to be used to attend DosGel 2004 in Belgium.

vii) CCPM Board Membership - 2 board members stepping down: G.Mawko and J.Schreiner. Contributions honoured at CCPM AGM.
2 new members joining Board: Michael Evans (Montreal, PQ) and J.Andrew (Charlottetown, PEI).

viii) CAMRT Guidelines for Training of Planning Technologists / Dosimetrists – CCPM is providing ongoing input/guidance on this document. W. Beckham and N. Sidhu CCPM representatives to this initiative.
J.P Bissonnette – inquired if this process is just a guideline or will it lead to certification?
B.Clark – Yet to be established. Ideally certification is the goal, however, starting with guidelines.

6. Professional Affairs Committee (PAC): (P.McGhee)
i) Terms of Reference - adjusted to reflect that this committee reports to COMP only. Available for review.

ii) Membership – Includes: J.Hayward, P.Johns, N, Kulkarni, J.Schreiner, D. Wilkins. Note that most are radiation therapy physicists from Ontario. Attempting to have PAC better reflect membership demographics. If anyone has interest in participating, please let committee know.

iii) Information Dissemination - Coming up w/classification scheme for information dissemination: public, COMP members only, PAC/Executive only. Issues identified re: data collection mainly due to several initiatives at national level regarding medical physics. COMP needs to develop repository for professional info. Will start to identify and collate sources of data.

iv) Evidence of Competency - This is a big issue. PAC started with equivalency. COMP recognizes only MCCPM as certification. Non-trivial process to determine CCPM equivalency with other certifying bodies. Current strategy to provide standardized document containing 3 sections: 1) outline Canadian process, 2) describe certification process for other country, and 3) compare and contrast two certification processes. Currently standardizing format. Idea is to provide working tool for someone (e.g. employer) when trying to make this assessment.

v) CSCC (Canadian Strategy for Cancer Control) – There is a federal initiative to assess the human resources aspect of cancer care. Several members of COMP PAC are also participants in CSCC. Currently going through survey process. Given that this agency could influence policies affecting the profession of medical physics, providing accurate information to this group is very important. Encourage everyone to ensure that department heads comply with survey when it arrives.

vi) Regulation of Profession – There have been a number of provincial initiatives towards licensure of medical physicists. COMP would like to support these initiatives, but needs more information on current activity. If one province is successful in their efforts and COMP was instrumental to this process, it could be used as a model to help other provinces.

vii) APEGGA (Association of Professional Engineers, Geologists and Geophysicists of Alberta) – Alberta Engineers proposing amendments to provincial Engineering Act. Draft amendments are so broad in scope, that they may effect the practice of medical physicists. CAP and COMP responded to this initiative by writing a letter to APEGGA and the Alberta Minister responsible for this Act. Also drafted letters to the federal Minister for Health and the Minister responsible for engineers in each of the other provinces to help raise profile of medical physics and to ensure that medical physicists are named as stakeholders in any discussions re: Engineering Act amendments.

viii) Exchange of Observers - There had been some past discussion of formalizing relationship between the PAC chairs of COMP/CAP or even our American counterparts by establishing an 'observer' position in respective Professional Affairs Committees. PAC advised COMP Executive not to pursue a formal relationship, however recognizes that it is important to build up liaisons and address common issues together (e.g. Alberta Engi-

(Continued on page 84)

neers Act). COMP PAC and COMP Chair did meet informally with counterparts at Winnipeg CAP/CASCA/COMP meeting

ix) Survey Completion
Salary Survey – a very important tool. Response rate currently ~50 – 60%. PAC wondering if low response is due to concerns about privacy. R.Hooper running survey and is sensitive to privacy. PAC interested in ideas to entice people to complete survey (e.g. online?)
Question from the Floor - When is survey issued?
P.McGhee – sent out very recently *(May/June)*
Speaker - Suggest sending out a little sooner (e.g. tax time.). Website a good idea.
P.McGhee – concern expressed in the past re: privacy when using on-line survey.

CSCC Survey - Asking info re: training programs etc. COMP supports completion of forms and membership should encourage those responsible (e.g. department heads) to complete this info.

x) Future Activity
Scope of Practice : Imaging – if anyone interested in participating, please identify yourself to PAC. Help is needed.
Professional Insurance – currently have an arrangement with Aeon. If not many people participate, prices go up… it's a vicious circle. Recent effort to look at another provider – (possibly HIROC *(Health Insurance Reciprocal of Canada)*). Question related to this topic posted in salary survey (e.g. What would you be comfortable paying for professional insurance?). Feedback requested.
Comment from the Floor – in some other professions, insurance is a condition of employment. Discussed issue in Saskatoon. Little interest on employers side – state that the medical physicists are already insured. May need a statement from COMP indicating that members should be insured. This might make a difference. Currently not convinced that we do need it, but don't know for sure.
P.McGhee – COMP in same position as membership. Most employers imply that insurance is there. Fortunately, there is very little litigation in Canada vs. the USA. Until there is a clear need demonstrated, hard for COMP to make a recommendation.
Comment from the Floor – the insurance currently offered only covers those working in Canada
P.McGhee – Difficult situation as no American insurance company will cover a Canadian working in the USA

7. Communications Committee: (D.Mason)
i) Website – new site up April 2004. Hardware/backup services hosted by AAPM. Site means more than just text on a page. Some administrative functions are available including membership directory database, email burster capability, etc..
InterACTIONS! – going well thanks to Boyd McCurdy. Please participate by making written contributions.
Advertising – undergoing major changes. History of slow service w.r.t. distributing job notices to members. Restructured service - clients have choice of: webpage posting, paper format (InterACTIONS!), and/or email burster. Advertising currently available to employers only. Established new fees (still relatively inexpensive). Julian Badragan (Calgary, AB) joined committee and is new contact person for job advertising.

ii) Future Activity
Online Payment of Dues – should be available (~ November, 2004). Online payment services company selected, but details not yet finalized.
Conference Services – included in agreement with AAPM. AAPM will provide infrastructure for abstract submissions.
J.P. Bissonnette- this year's abstracts published in Physics in Canada. Also in Medical Physics?
C.Arsenault – not this year. Certainly next year.
Sponsorship / Advertising on Website – looking to recover costs of website w/discreet advertising, links, etc..
Other : Listserver
D.Rogers – what is status of listserver?
D.Mason – currently dead. Made a plea in InterACTIONS! asking for volunteers to restart listserver. It was an open mailing list run by Robarts Research Institute. They no longer support it due to new policy that IT efforts should be related only to the work of the lab. No one else stepped in to take it over. Listserver open to volunteers. Note that it benefited more than just COMP members. Had an international audience.
D.Rogers – hardware is available, but has not yet identified a person to take this on.

8. Radiation Safety and Technical Standards Advisory Committee (RSTSAC): (C.Arsenault presenting for P.Dunscombe)
i) CRPA (Canadian Radiation Protection Association) – Formal liaison established. COMP representative is G.Mawko. Undertaking a few initiatives (e.g. drafting RSO certification process). COMP/CCPM needs to stay in touch with this process and ensure CCPM radiation safety component relevant. Want CCPM membership to remain a statement of RSO competence. Also compiling a survey to collect a database of training material in radiation safety (e.g. materials for security / housekeeping staff).
Membership – RSTSAC reviewing membership – P.Dunscombe is chair, H.Johnson stepping down. Will try to recruit new members.

ii) CNSC – Circulating draft document *S-213 "Requirements for QA Programs in Nuclear Facilities"*. Document lists requirements for the structure of the QA program for every Class 1 and Class 2 nuclear facility (this is not the same as "machine QC"). All medical linear accelerators are Class 2. RSTAC feels that it would shift health care money into administration rather than patient care. It is also not necessarily required in a hospital setting as a QA structure should already be in place. P.Dunscombe and C.Arsenault wrote letter of response proposing that Class 2 equipment be exempt. Have only received back a letter of acknowledgement.
N.Sidhu – should CEO of cancer centres also be writing a letter?
C.Arsenault - documents sent to all licensed facilities for comment. Open to anyone to respond.

9. Report from the Treasurer: (H.Patrocinio)
i) COMP Financial Audit – 2003 accounts audited by Randall Miller and found to be in good order. He made one recommendation: COMP Ex-

(Continued on page 85)

ecutive / CCPM Board Midyear meeting expenses should be documented in a separate expense sheet (similar to the summer COMP meeting). This expense sheet should be looked over and approved by another COMP Executive member.
Motion to nominate Randall Miller as auditor of the COMP 2004 financial reports: H.Patrocinio *Second:* from floor *Vote:* Carried

ii) 2003
Balance Sheet (December 31, 2003)
COMP Total Assets: $195,338.05
COMP Total Unpaid Liabilities: $7,329.07
Assets minus Liabilities: $188,008.98
Increase from last year, however there are some upcoming invoices that have not arrived (work not yet billed by M.Henry)

Income statement (Jan 1 – Dec 31, 2003)
Total revenues: $76,819.93
Total Expenses: $66,894.55 Transfers to Reserve: $11,747.79
Total 2003 dues: $51,062. This is higher than usual mainly due to several members clearing up payments that were in arrears.
Newsletter (InterACTIONS!) – incurred a $10,889.12 deficit. Mainly due to low 2003 income as a result of very delayed billing. Invoice payments are only now trickling in.
2003 Scientific Meeting – in accordance w/2004 budget and recommendations from last year's accounting review, income from 2003 scientific meeting not reported in 2003. Appears as deferred income for 2004.

Budget Variance (Jan 1 – Dec 31, 2003)
Net loss in Operating Budget: $1,822.41
Executive Director – not meeting the $19,000 budgeted for 2003. Have not yet received a final billing from M.Henry for rest of this amount.
Subscriptions – show profit of $3,037.98, however this amount does not reflect the fact that subscription notices are sent out in 2003 and are not paid for until 2004. Some variance also due to stronger Canadian dollar.
P.Johns – suggests that the subscription price listed in the annual dues renewal be adjusted to reflect USD-CAD exchange rates as of Nov/Dec.

Other: *Office Float* – liquidated and replaced w/$500 limited credit card. Larger expenses go through the treasurer

iii) 2004
Interim Report
2004 Dues - $44,826
Subscriptions - indicate a loss of $4,225.20 mainly due to money coming in late in 2003

Interim Balance Sheet (as of May 31, 2004)
Net worth $202,741.46 (does not include GIC accrued interest)

iv) 2005 Budget
Winnipeg 2004 Meeting – LAC reports that this meeting should make >$16,000 profit
Executive Director – increased contract amount from $19,000 to $25,000 (intend to hire on someone > 1 day/week)
Website – added as a budget item. Anticipating substantial expense ~$10,000 USD/year. However, expecting revenues from advertising – amount undetermined. Budgeting a deficit of $9,000.
Motion to accept 2005 COMP Budget: H.Patrocinio ***Second***: from floor ***Vote:*** Carried

v) Membership Dues - Looking at fee restructuring.
Motion to reduce retired fees from $70/year to $20/year: H.Patrocinio ***Second***: from floor ***Vote:*** Carried

Motion to reduce emeritus fees from $25/year to $0/year: P.Dickof ***Second:*** from floor ***Vote:*** For – 19, Against – 14, Abstain – 6
Motion: Carried (per COMP Bylaw ARTICLE V.F)
vi) Other - Travel expenses for COMP Exec / CCPM Board members. Considering an adjustment of per diem rates. Current rate ($35/day) proposed in 1993.

10. <u>Report from the Secretary:</u> (A.Bergman)
i) Membership – As of June 2004, the COMP membership is as follows:

Category	June 2004	May 2003	Change
Full	362	342	+20
Associate	5	3	+2
Student	55	56	-1
Retired	2	1	+1
Emeritus	9	11	-2
Corporate	15	19	-4
Totals	**448**	**432**	**+16**

(Continued on page 86)

ii) CIHI (Canadian Institute for Health Information) – Membership data sent to CIHI as part of the publication ***"Health Personnel Trends in Canada, 1993 to 2002"*** now available at www.cihi.ca. PAC also submitted description of "medical physicist". Medical physics one of 21 health professions featured in the document. 5 pages dedicated to the profession.

iii) 2003 COMP Membership Directory – note that a table has been added that categorizes the membership statistics by province

iv) Proposal of Bylaw Changes – COMP Executive would like to formalize a process for dealing with the situation when only one nomination for an Executive Position is put forward to the membership.

1) ARTICLE IV. B. 6 : ELECTION OF OFFICERS – change of wording

Current wording: "6. Election of officers will be made by mail ballot according to article X. Ballots will be counted…."

Proposed wording: "6. *If more than one nomination is received by the nominating committee*, election of officers will be made by mail ballot according to article X. Ballots will be counted…"

Motion to change the wording of ARTICLE IV.B.6. to that proposed above: A.Bergman ***Second:*** H.Patrocinio ***Vote***: Carried

2) ARTICLE IV.B.: ELECTION OF OFFICERS – addition of a paragraph

Proposal to insert the following paragraph after ARTICLE IV.B.6. and name this new paragraph ARTICLE IV.B.7. The original ARTICLE IV. B.7. will be renamed ARTICLE IV.B.8. Subsequent paragraphs will also be renumbered.

Proposed wording:

"7. If only one nomination is received by the nominating committee, the Chair of COMP will call for nominations from the floor during the Annual General Meeting. If there are no further nominations, the nominee will be appointed to the office by acclamation. If nominations are received from the floor, election of officers will be made by ***show of hands****.*

8. The Executive thus elected….

9. In the event that a resignation…."

Motion to insert the paragraph proposed above and renumber subsequent subsections appropriately: A.Bergman ***Second:*** M.Kolios

Discussion from floor – perhaps a show of hands is not appropriate should a second nomination for a COMP Executive position be made from the floor. Secret ballot would be better.

Motion to amend the bylaw change to read: *"7. If only one nomination is received by the nominating committee, the Chair of COMP will call for nominations from the floor during the Annual General Meeting. If there are no further nominations, the nominee will be appointed to the office by acclamation. If nominations are received from the floor, election of officers will be made by* ***secret ballot****":* J. Hayward

Second: from floor ***Vote*****:** Carried

11. Nominations Committee: (C.Arsenault)

A Call for Nominations was published in InterACTIONS! for the following Executive positions: Chair-Elect and Secretary. No nominations were received from membership. The Nominations Committee was asked to try and find individuals to stand for office. The following candidates have agreed to be nominated and are presented for election here at the AGM:

Chair Elect – Stephen Pistorius (Winnipeg, MB). Requests for further nominations from the floor were made. None received. S.Pistorius is the new Chair-Elect of COMP by acclamation.

Secretary – Will Ansbacher (Victoria, BC). Requests for further nominations from the floor were made. None received. W.Ansbacher is the new Secretary of COMP by acclamation.

12. Future COMP Meetings

2005 – Hamilton, Ontario: July 6 - 9 – Venue changed from Brock University to McMaster University. Reason is that the vendor/exhibitor space location was not near the main COMP sessions.

2006 – Presentation made by N.Sidhu for the possibility of a Saskatoon, Sask venue. The Canadian Light Source (synchrotron) would also be willing to help sponsor part of the meeting. Venue would be the University of Saskatchewan. Expect a total cost of ~$60,000 and ~400 participants. The city of Saskatoon has offered to assist with transportation issues for off-site activities.

Motion to hold the 2006 COMP annual meeting in Saskatoon, Saskatchewan: N.Sidhu ***Second:*** H.Patrocinio

D.Rogers – should try to avoid June 24 as that is St.Jean Baptiste day in Quebec

Vote: Carried

2007 – not yet determined

2008 – Presentation made by L. Beaulieu for the possibility of a Quebec City, PQ venue. Noted that it correspondes to the 400th year anniversary of Quebec City.

Motion to hold the 2008 COMP annual meeting in Quebec, PQ: L.Beaulieu ***Second:*** J.Battista

P.Johns – noted that one of the proposed meeting facilities had only 250 seats. This will not be enough. Should aim for 300 – 400 people.

Vote: Carried

13. Other Business

i) COMP Executive Membership

Gino Fallone was thanked for his contribution to COMP and presented with a plaque. He served as chair-elect, chair and past-chair for a total term

(Continued on page 87)

COMP AGM Minutes *(Continued from page 86)*

of 6 years. Alanah Bergman was thanked for her service to COMP as Secretary and presented with a plaque. She served on the Executive for 3 years. Clement Arsenault has finished his 2 year term as COMP Chair. He will continue on as a member of the COMP Executive but in the Past-Chair position.

Peter O'Brien will move from Chair-Elect to COMP Chair where he will serve 2 years in this position. He was presented with the COMP gavel and book of "Roberts Rules of Order" by C.Arsenault. P.O'Brien thanked Clément Arsenault for his contribution to the COMP Executive and the membership while in the position of Chair.

ii) Awards
J.P. Bissonnette – Thanked the judges who participated in the J. Cunningham Young Investigator Symposium and the Poster Competition
J. Cunningham YIS – 1st: K. Surrey (London, ON) **2nd:** Brad Warkentin (Edmonton, AB) **3rd:** William Song (London, ON)
2004 COMP Poster Competition (2 prizes awarded) – Jean-Francois Carrier (Quebec, PQ) and Mike Oliver (London, ON)
Sylvia Fedoruk Award (for best paper published in 2003 by a Canadian research group) - Abbas Samani, Jonathan Bishop, Chris Luginbuhl and Donald B. Plewes, *"Measuring the elastic modulus of ex vivo small tissue samples",* Phys.Med.Biol. 2003, (48), pp. 2183-2198.

14. Adjournment
Motion to adjourn 2004 COMP AGM: N.Kulkarni ***Second:*** J.P. Bissonnette**.** ***Vote:*** Carried.

Meeting adjourned: 7:10 PM.

Harold E. Johns Travel Award

The winner of this year's Harold E. Johns Travel Award is Michelle Hilts of the BC Cancer Agency's Vancouver Clinic. Congratulations Michelle!

The award of up to $2,000 will be used by Michelle to help in her expenses associated with attending the DOSGEL 2004 meeting to be held in Ghent, Belgium in September.

Members of the CCPM (less than three years since gaining membership and under 35 years of age) are encouraged to apply for this award.

Wayne Beckham
Registrar, CCPM

Workshop on Alternatives to Mammography (WAM) September 18th to 20th, 2004, Winnipeg, Canada

http://www.win.trlabs.ca/wam/

This workshop will provide a forum to discuss, compare and combine several currently used and experimental techniques to image the breast. Talks will be highly technical, not clinical, aimed at detection of early breast cancer, and in language clear to any engineer or physicist working on other detection modalities. The intended audience is medical physicists, computer, robotic and biomedical engineers, and scientists who work in the area of developing novel imaging technology and software for imaging the breast, or who do post-processing or networking of these images, and breast cancer epidemiologists. Eleven hours of continuing education (CE) credits for this event are available from the Canadian College of Physicists in Medicine or the Canadian Organization of Medical Physicists.

There will be over 20 speakers and a poster session. Publication of the workshop is planned within the peer-reviewed journal "Technology in Cancer Research and Treatment".

Activities include a Saturday night collaboration and poster session, Sunday evening dinner, and Monday evening special event. Please see our website for agenda and relevant information. Please contact Julie Stewart for a speaker list or any other questions (jstewart@trlabs.ca).

COMP Treasurer's Report

June 2004 AGM, Winnipeg, MB

By Horacio Patrocinio, McGill University Health Centre, Montréal, PQ

2003 Financial Year (Final Report)

The financial statements of the COMP for 2003, prepared by the treasurer, were audited by Mr. Randall Miller and found to be in good order, and to accurately describe the financial state of COMP. The following are some of the key highlights of the 2002 financial year:

1. As of Dec 31, 2003 the net worth of the organisation stood at $188,009, which is 6.5% higher than the 2002 figure. $73,964 was in our current account (23.7% above that of 2002 year end), but there was over $7,300 liabilities associated with our Credit Card and cheques that have been issued but not cleared. The value of our GIC investments (reserve) stood at $121,374, which includes $3,073 in interest earned in 2003.
2. 2003 dues brought in $51,062 (Corporate $10,368; Full $39,004, Student $1,330, Other $360) well above the budgeted $42,000. However only $39,222 of these dues were received in the 2003 financial year. 2004 dues had brought in $19,078.59 by year-end, allowing us to exceed the $42,000 that we budgeted for in the 2003 financial year.
3. The 2004 Budget, which was approved by the membership at the 2003 AGM, has been restructured to include income from the 2003 scientific meeting as differed revenue for 2004. This will allow for a balanced budget without the need to transfer funds from our reserve to the operating budget. This practice is supported by recent experience where scientific meetings designed to break even incur profits due to vendor participation. It is anticipated that this participation will increase even further as the organization becomes even more visible through its newly redesigned web site.
4. The office float of 2000$ was liquidated in July 2003 and replaced with a Secretariat credit card (500$ limit). This will ensure a greater transparency in the future, as the office float was a personal account not belonging to COMP.
5. The COMP 2003 meeting in Edmonton made a profit of $15379.18, which was very close to the estimated budget of $14300.
6. "InterACTIONS!" incurred a deficit, largely due to lower advertising revenue and delayed invoicing.
7. At year-end, we had not received final invoicing from our executive director which accounts for a 10,000$ discrepancy with the budgeted amount.
8. Our 2003 budget had anticipated the need to transfer $16500 from our reserve in order to balance our operating budget. In actual fact, this was not required and we ended up with a small deficit ($1,822) after a transfer of $11,748 to maintain our reserve relatively constant.

2004 Financial Year (Interim Report)

The following are some of the key highlights of the start of the 2004 financial year:

1. As of May 31, 2003 the net worth of the organisation stood at just under $203,000. $88,117 was in our current account but there was over $2100 liabilities associated with credit cards and cheques that had been issued but not cleared. The value of our GIC investments (reserve) stood at $121,726, excluding interest accrued but not listed on recent statements.
2. 2004 dues brought in $44,826 (Corporate $6,872; Full $35,970, Student $1,144, Other $840). However only $25,747 of these dues were received in the 2004 financial year.
3. Subscriptions for 2004 incurred a $2022 profit (revenues $12,179 and expenses of $10,157) due to the higher US exchange rate. However, due to subscriptions paid late in 2003, the 2004 interim statements show a deficit.

(Continued on page 89)

COMP Treasurer's Report (Continued from page 88)

BALANCE SHEET (December 31, 2003):

Account	Description	January 1, 2002	December 31, 2002	Notes
ASSETS				
Bank Account	main account at TD-Canada Trust	$59,776.58	$73,964.49	
GIC Accounts	3 GIC investments	$121,221.48	$121,373.56	1
Office Float	Secretariat account	$2,003.95	$0.00	2
Total Assets		*$183,002.01*	*$195,338.05*	
LIABILITIES				
Credit card balance	COMP Treasurer	$3,484.84	$2,088.83	
Credit card balance	Secretariat	N/A	$23.20	
Cheques not cleared		$3,010.24	$5,217.04	
Total Liabilities		*$6,495.08*	*$7,329.07*	
ASSETS LESS LIABILITIES		**$176,506.93**	**$188,008.98**	

Notes 1. Includes interest compounding in investment accounts (Dec. 31, 2003 value)
2. Office Float was liquidated and replaced with a secretariat credit card (500$ limit)

(Continued on page 90)

In Brief

Michael Bronskill Stepping Down

After nearly fourteen years, Michael Bronskill is stepping down as director of Imaging Research at Sunnybrook & Women's Research Institute. Under Mike's stewardship, this research group has grown from about 40 people in 1990 when it began at S&W to over 150 in 2004. There are now 11 scientists or senior scientists in the group with approximately 30 graduate students in the physics stream of the Department of Medical Biophysics at the University of Toronto. The research funding for the group is now about $8 to 10 million per year. Mike will remain with the group at Sunnybrook & Women's concentrating on research into MR-image-guided techniques for minimally invasive interventions and thermal therapies. Don Plewes will serve as interim director and an open search for a permanent replacement is underway.

This year, Mike has also been elected as a Fellow of the American Association of Physicists in Medicine for distinguished contributions to medical physics. This award will be presented at the AAPM annual meeting in Pittsburgh in July.

COMP Executive Welcomes New Faces

The COMP Executive welcomes two members freshly elected at the June 15 AGM in Winnipeg. Dr. Stephen Pistorius of Winnipeg will serve as Chair-Elect, and Dr. William Ansbacher of Victoria will serve as Secretary.

Dr. Stephen Pistorius,
COMP Chair-Elect

Dr. William Ansbacher,
COMP Secretary

COMP Treasurer's Report (Continued from Page 89)

Income Statement

January 1, 2003 through December 31, 2003

Description	2003
Bank Account Balance at Jan 1, 2003	**$59,776.58**
Office Float Balance at Jan 1, 2003	$2,003.95
Credit card balance at Jan 1, 2003	($3,484.84)
Operating balance at Jan 1, 2003	**$58,295.69**
REVENUE	
Donations	$1,026.59
Dues (2003)	$39,221.93
Dues (2004)	$19,078.59
Newsletter	$100.00
Other	$1,072.80
Subscription	$16,291.23
Interest	$28.79
Membership List	$0.00
Transfer from Reserve	$0.00
TOTAL REVENUE	**$76,819.93**
EXPENSES	
ABR/CMA Accreditation	$1,450.01
Awards/Support	$1,000.00
Bank Charges	$256.35
CAMPEP	$3,657.18
CCPM	$0.00
Committee Expenses	$1,198.27
Corporate Fees	$30.00
Donations	$1,115.52
Directory & Publications	$2,377.97
Executive Director	$9,122.76
Mid Year Meeting	$8,588.48
Miscellaneous / Other	$431.56
Newsletter	$10,889.12
Office	$2,760.29
President's Discretionary Fund	$500.00
Secretariat	$8,650.00
Society Memberships	$1,366.54
Subscriptions	$13,253.25
Plaques	$247.25
TOTAL EXPENSES	**$66,894.55**
Income less Expenses	**$9,925.38**
Transfer to Reserve	**$11,747.79**
Operating balance at Dec 31, 2003	**$56,473.28**
Credit card balances at Dec 31, 2003	$2,112.03
Revenue deffered to 2004 (Scientific meeting)	$15,379.18
Bank Account Balance at Dec 31, 2003	**$73,964.49**

Note:
The value of the office float on Jan 1st, 2003 was $2003.95, not $2000 as reported on the 2002 balance sheet.

Budget

Description	2004	2005
GENERAL INCOME		
Dues	$47,000.00	$47,000.00
Defered revenue (AGM)	$14,000.00	$16,000.00
Short-Term Interest	$100.00	$100.00
Membership List	$500.00	$500.00
TOTAL INCOME	**$61,600.00**	**$63,600.00**
OPERATING EXPENSES		
Awards/Support	($1,500.00)	($1,500.00)
Bank Charges	($100.00)	($100.00)
Committee Expenses	($1,500.00)	($1,500.00)
COMP/CCPM Representation	($6,000.00)	($6,000.00)
Corporate Fees	($30.00)	($30.00)
Directory and Publications	($4,000.00)	
Directory		($2,000.00)
Discretionary Fund	($1,500.00)	($1,500.00)
Executive Director	($19,000.00)	($25,000.00)
Insurance		($1,000.00)
Mid Year Meeting	($10,000.00)	($10,000.00)
Newsletter	($4,000.00)	($4,000.00)
Office	($2,500.00)	($2,500.00)
Plaques	($200.00)	($200.00)
Secretariat	($8,300.00)	($9,200.00)
Society Memberships/ Sponsor	($3,000.00)	($3,000.00)
Web Site		($5,000.00)
TOTAL EXPENSES	**($61,630.00)**	**($72,530.00)**
NET (INCOME - EXPENSES)	***($30.00)***	***($8,930.00)***
Transfer to/from reserve	**$30.00**	**$8,930.00**
RESERVE (first of year)	**$121,373.56**	**$104,343.56**
Investment Interest	$3,000.00	$3,000.00
Transfer to/from Operations	($30.00)	($8,930.00)
Web Site Development	($20,000.00)	
RESERVE (end of year)	**$104,343.56**	**$98,413.56**

Radiation Oncology Planning with a PET/CT Simulator

By Kathy Mah, Curtis Caldwell, and Parminder Basran, Sunnybrook and Women's Health Sciences Centre, Toronto, Ontario

On August 18, 2003, a new GEMINI PET/CT scanner (Philips Medical Systems) arrived at Toronto Sunnybrook Regional Cancer Centre. The arrival of the unit was a culmination of almost two years of planning. This unit was the second PET/CT scanner in Canada and the first to be installed in a radiation oncology planning department. Its acquisition was possible through the combined efforts of the Nuclear Medicine and Radiation Oncology Programs at Sunnybrook and Women's College Health Sciences Centre and a combination of funds from Cancer Care Ontario (CT portion) and a private donor (PET portion).

SYSTEM DESCRIPTION

The Gemini PET-CT system consists of an air-cooled, dual slice CT scanner (MX8000) and full body PET imaging system (Allegro) with a novel couch and dual gantry design. The PET gantry can be positioned adjacent to or retracted away from the CT gantry. The dual gantry was designed to facilitate interventional procedures and to minimize patient claustrophobia. While PET scanning is possible with the gantries in either position, the maximum scan length of 195 cm is reduced by 60 cm longitudinally when the PET gantry is retracted away from the CT. Bore diameters are 70 and 63 cm for CT and PET gantries, respectively. The CT is a third generation design with 1344 solid state ceramic detectors configured in two distinct arcs. The PET detector system consists of 17,864 gadolinium oxyorthosilicate (GSO) crystals, configured within a cylinder with 28 segments of GSO crystals in a 29 x 22 array. The dimension of each crystal is 4 mm (transverse) x 6 mm (axial) x 20 mm (radial). The crystals are arranged as a continuous-pixelated detector rather than as block detectors. In the axial direction, the PET FOV is 18 cm with each frame acquired with approximately 50% overlap. The recommended acquisition time is 3 min per frame with a count rate of over 8 million. There are two workstations, a CT host and a PET server for reconstruction as well as two additional computers for CT reconstruction and for PET acquisition. All computers are connected with a local area sub-network. The system is capable of DICOM export of both DICOM CT and DICOM PET. Two methods of attenuation corrections can be applied to the raw PET emission data. One method makes use of a 740 MBq Cesium-137 source, which is housed in the PET gantry and can be used to produce Cs-137 transmission images of patients or of phantoms for daily quality assurance. The single rotation time is approximately 1 minute per bed position. Alternatively, the CT dataset can be used to calculate a 511 keV equivalent transmission map.

The unique couch design consists of a stationary base and translatable dual pallets and is shown in Figure 1. The lower pallet is structurally reinforced and forms the translatable base on which the upper patient pallet moves. As a support structure, the lower pallet extends for both CT and PET imaging but stops before the imaging plane for the relevant modality. The lower pallet is non-scannable in either modality. To counteract the cantilever effect of the pallets during full extension, a separate support assembly is located between the CT and PET gantry. This assembly contains a support base and a pair of talons, which locks onto the lower pallet during PET mode. The total longitudinal travel of the upper pallet on the lower pallet is approximately 190 cm and more than 330 cm when the lower pallet is moved through its total extent. Upper pallet motion is designed with a precision of 0.25 mm under full load of 215 kg. For radiation therapy planning, a carbon-fibre table-top was installed on the upper pallet and external lasers mounted in the room.

ACCEPTANCE AS A RADIATION SIMULATOR

Being only the third unit off the assembly line, it was anticipated that installation and acceptance would not be a smooth process. Installation took four weeks including one week of waiting for new electronic boards. Two separate

(Continued on page 92)

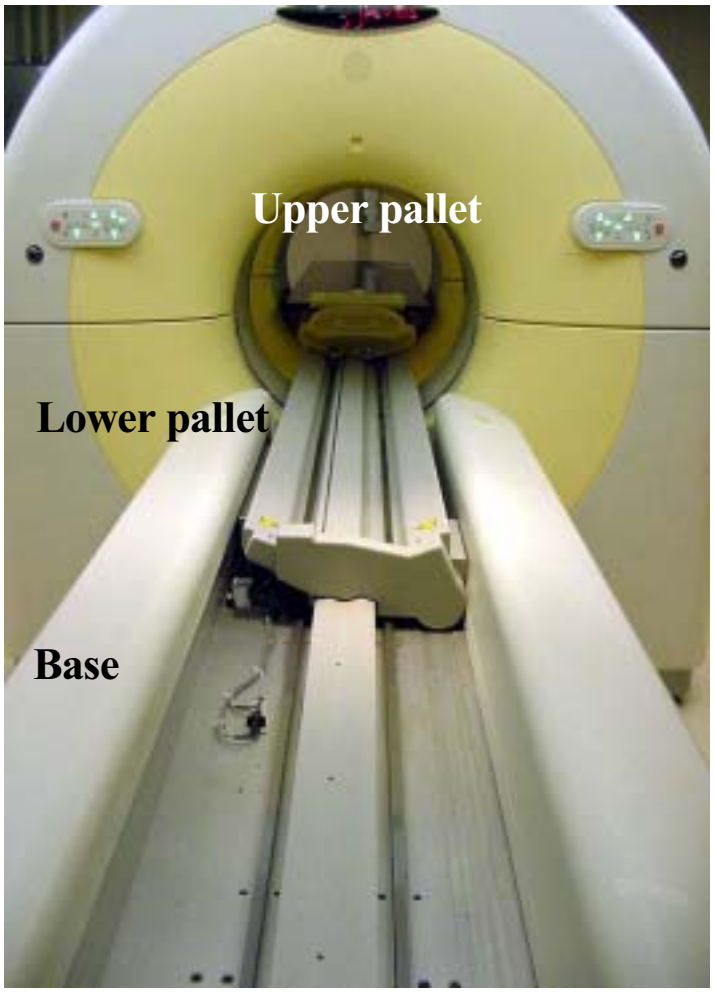


Figure 1: The Philips Gemini PET/CT showing full extension of the patient support assembly for PET scanning mode. The CT gantry is in front, with the PET gantry (not visible) behind. The lower pallet is metallic and is the support on which the upper patient pallet moves. The carbon fibre radiation therapy top is attached to the upper pallet.

PET/CT Simulator (Continued from page 91)

installation teams were deployed; one from the CT division and one from the Nuclear Medicine Division of Philips Medical Systems. With a week required for room finishing, the unit was available for acceptance testing by September 22, 2003.

While no single source provides guidance on the acceptance testing for such systems, testing should include the sum of tests ascribed from recognized standards. Acceptance testing and quality assurance processes have been defined for CT scanners by the American Association of Medical Physicists (AAPM) Task Group 2, Report 39 and a similar set of tests have been described for PET systems by the National Electrical Manufacturers Association (NEMA).[1,2] When these systems are used in radiation treatment simulation, additional tests must be conducted with emphasis on spatial integrity, CT number accuracy, alignment of couch with image planes, and patient marking laser systems. Tests for CT scanners for simulation purposes are described in a recent report from the AAPM Task Group No. 66.[3]

In terms of image quality, both CT and PET sub-systems met specifications in almost all aspects of standard testing. In this report, only a few test results will be mentioned. For PET, spatial resolution was measured using the full width at half maximum (FWHM) of reconstructed image point spread functions (PSFs) measured at 1 cm radius and at 10 cm radius away from the central axis. At 1 cm radius, the FWHM was 5.51, 5.63, and 5.83 mm for transverse (x-y plane) radial, transverse tangential, and axial (z-plane) directions, respectively. At 10 cm radius away from the central axis, the FWHM was 5.29, 5.60, and 6.44 mm along the radial, tangential, and axial directions, respectively. The overall NEMA count rate results were quite favourable and are shown Figure 2.

For radiation therapy simulation testing, two parameters did not meet our specifications initially. First, while the couch base and lower pallet were level in both longitudinal and lateral planes, the upper pallet was found to have a systematic incline of Ω1.1° in the longitudinal plane with no load and Ω0.7° with a load of 145 kg, resulting in a distinctive upwards slope (Figure 3a) towards the gantries. The upper pallet incline was intentional in the manufacturer's design of the patient support assembly. These measurements were performed over the course of 1 hour and did not change with time or with longitudinal position of the upper pallet, being consistent for both CT and PET modes. While this angle may not affect the use of Gemini for diagnostic radiology purposes, it has implications in radiation oncology. To illustrate the problem, a long plastic rod was placed on the upper pallet and scanned over 67 cm of its length. Between the first and last CT image, the image of the rod was displaced vertically by about 10 mm (Figure 3b). This angle results in 3D reconstructions from the CT dataset that no longer mimic the patient position relative to the horizontal plane defined by a therapy couch as demonstrated by the lateral digitally-reconstructed radiograph (DRR) of Figure 3c. In 3-dimensional conformal radiation therapy (3DCRT), where shielding can be designed to accuracy of ∂1 mm, positional errors of 10 mm could lead to significant over- or under-dosing as a result of planning beams on image sets that do not simulate the patient position on treatment. This positional discrepancy could also lead to inaccurate dose calculations. Furthermore, a flat, carbon-fibre therapy table top attached to the upper pallet would follow this incline and result in an air gap between the table top and the upper pallet since the former is secured to the upper pallet baseplate and tip. Consequently, a load placed on the table top resulted in a flexing of the table top. To level the table top, a 3 cm offset plate was made in-house and was placed at the attachment baseplate for the upper pallet. Small styrofoam spacers of variable thicknesses were also made to support the table top over its length when load is added. (Figure 3d). In March 2003, the upper pallet was redesigned and replaced by the vendor with a reduced systematic incline that met specifications (<0.5°). Subsequently, table incrementation was tested and table motions were within specifications (+/- 0.25 mm) when displaced along the vertical and horizontal directions and these motions were orthogonal.

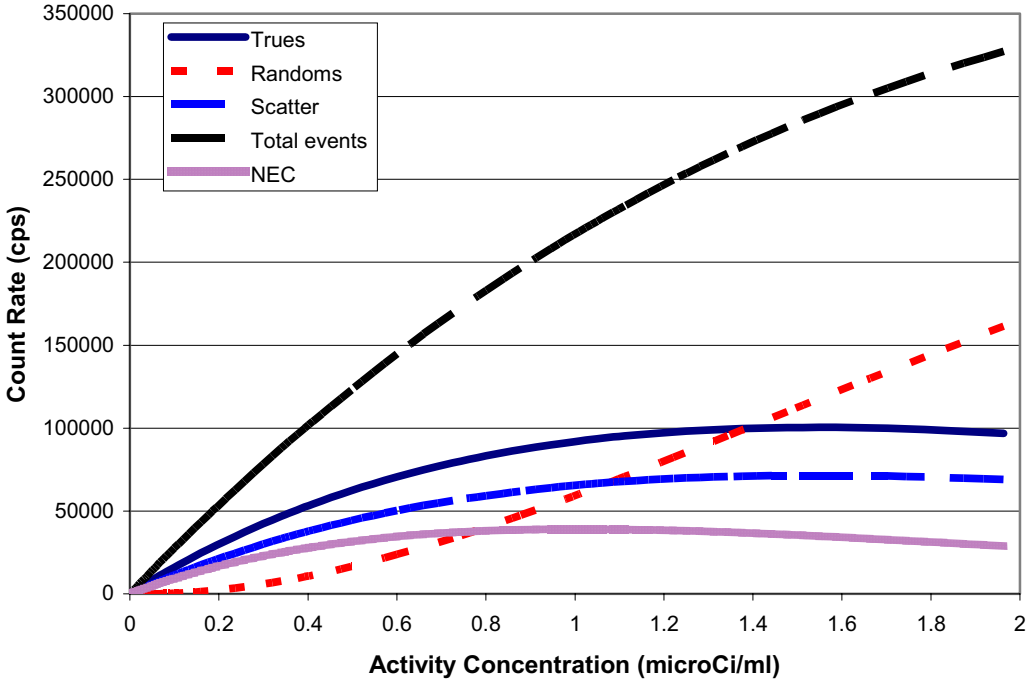


Figure 2: Measured NEMA count rates for the PET scanner. The true (blue), randoms (dotted red), scatter (dashed blue), total (dashed black), and noise equivalent (purple) count rates are plotted against activity concentration.

(Continued on page 93)

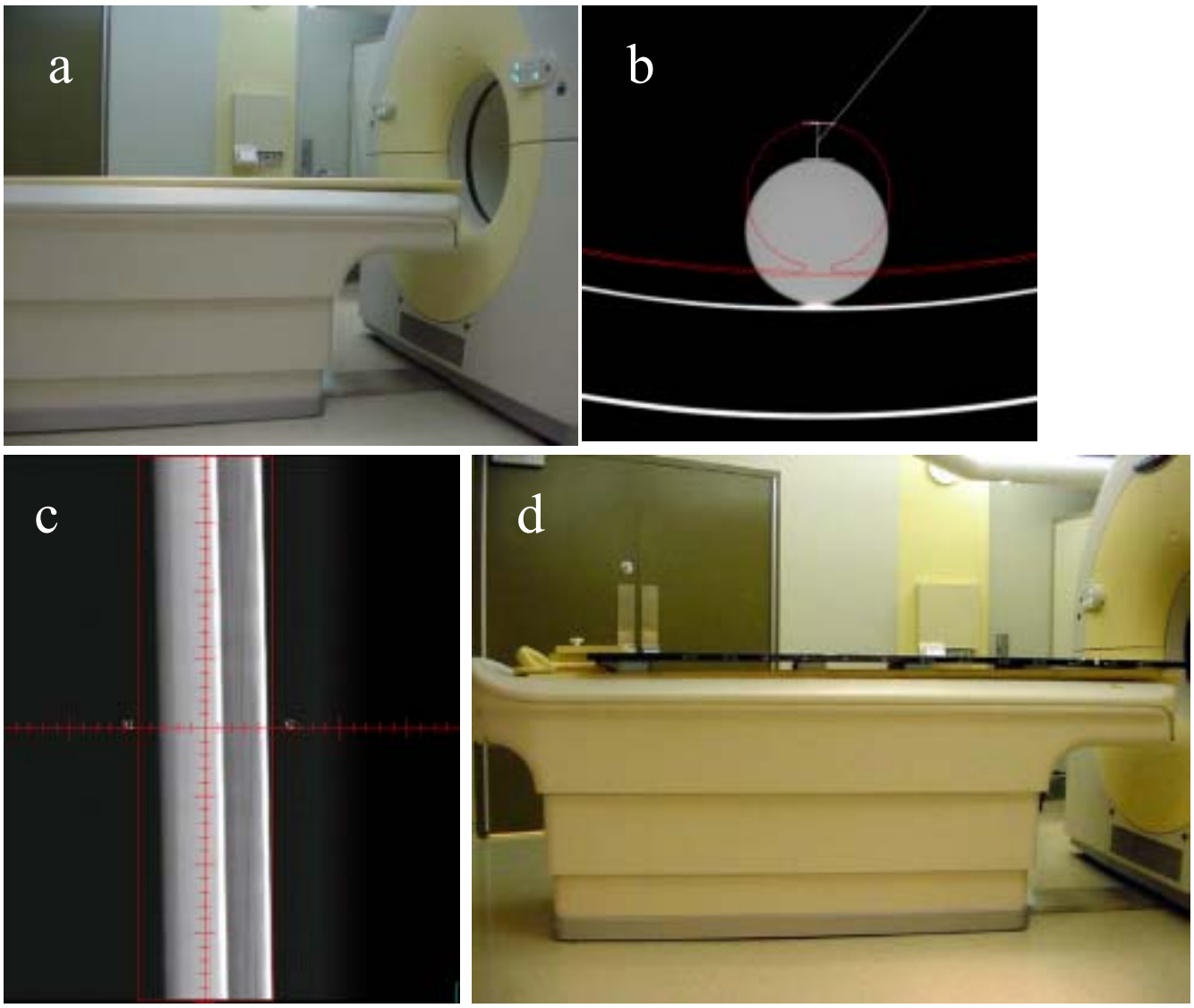


Figure 3: (a) Original patient support assembly with 1^{o} incline of the upper pallet. (b) Transverse CT image of a rod placed on the upper pallet overlaid with the graphical display of the rod when imaged 67 cm closer toward the gantry. A 1 cm antero-posterior shift can be seen as a result of the upper pallet slope. (c) A lateral DRR showing the incline of the rod and potential problem for therapy planning. (d) To insure a flat, horizontal table to mimic treatment, a 3 cm plate was made in-house and placed under the attachment point of the RT table top to the upper pallet. Styrofoam inserts were placed under the table top to compensate for the gap between the horizontal RT top and the inclined upper pallet.

PET/CT Simulator (Continued from page 92)

The second interesting finding was a rotation of the reconstructed CT images in a counter-clockwise direction by approximately 0.42 degrees from true levels even though the installers had verified that the physical CT gantry was level. This rotation between the reconstructed image and true horizontal was measured using a precision alignment jig that is used to align therapy room lasers. The rotation was attributed to a minor error within the reconstruction software. While this rotation would be considered insignificant in diagnostic imaging, it is a concern in radiation oncology simulation. A rotation can lead to a systematic error in depths for set-up and dose calculations. For example, for a patient lateral separation of 40 cm, this rotational error would result in a 3 mm antero-posterior discrepancy between true lateral points on the patient's skin surface. This systematic error is unacceptable for simulation purposes. To correct this, the entire CT gantry apparatus was rotated in the clockwise direction to offset this processing error. Once re-aligned, CT images were found to satisfy all spatial linearity testing. Once the above issues were rectified, the Gemini PET/CT system performed favorably as a PET/CT-simulator. The unit began CT-simulation on patients in late October 2003, while the first patient for PET/CT was scanned in late November 2003.

OPERATIONS OF THE PET/CT-SIMULATOR AT SUNNYBROOK

The GEMINI is used for clinical CT-simulation and for PET/CT research in radiation oncology. At this time, all PET patients are on research protocols and all PET-associated costs are funded by research grants. On the days allocated for PET/CT scanning, 2-[^{18}F]fluoro-2-deoxy-D-glucose (FDG) is delivered to our centre by 10 am from the cyclotron facilities at McMaster University in

(Continued on page 94)

PET/CT Simulator (Continued from page 93)

Hamilton (Hamilton is approximately 1 hour drive from Toronto in non-rush hour traffic). Patients arrive at the Nuclear Medicine department where Nuclear Medicine technologists will measure blood-glucose levels, measure vital signs for Health Canada clinical trials, draw up and inject the appropriate dose of FDG. Patients rest in reclining chairs in a dedicated room in the Nuclear Medicine area for approximately one hour post-injection. After being asked to void their bladder, patients are directed to the PET/CT suite in the Radiation Oncology Planning area which is located in the adjacent wing in the hospital.

Once in the PET/CT suite, patients are positioned in radiation therapy position by radiation therapists. With all treatment ancillary devices in place, patients are marked with reference set-up points positioned in the vicinity of their known primary disease. Radiation therapists and nuclear medicine technologists perform scanning jointly. The CT is acquired first, followed by PET emission. The PET emission acquisition requires approximately 30 minutes (10 bed positions with 50% overlap at 3 min each) for a typical whole body scan. After scan completion, vital signs are again measured as required by Health Canada clinical trials and reference marks are tattooed. Total patient time in the PET/CT suite is typically 45 to 60 min. PET emission data are processed into images using a 3D-RAMLA algorithm and subsequently, reprocessed using the CT-derived transmission map to produce attenuation-corrected PET emission images. Image registration software is available on the PET server both for viewing the CT and PET images in parallel and to re-register images should the patient move between the CT and PET portions of the examination. The technologists verify image co-registration. Both PET and CT images sets are sent to the Philips Pinnacle treatment planning via DICOM.

SUMMARY

Image quality of clinical images is excellent and staff at our center have been extremely satisfied with the clinical images. Figure 4 shows the coronal and sagittal PET/CT images of one example patient who was referred to our center for radical radiation therapy of the lung. In addition to the lung primary and nodal involvement, PET imaging detected a new second primary of the rectum. For individual cases, the new information acquired from PET has resulted in more appropriate management of the patient. For 3DCRT of certain solid tumours, PET may help to define targets with greater accuracy and consistency. The impact of PET/CT technology in radiation oncology is only now being assessed and this will be our main area of focus for PET/CT research. The functional and anatomic information provided by combined PET/CT scanners will undoubtedly be a valuable tool for radiation oncology, both in targeting and monitoring response to treatment.

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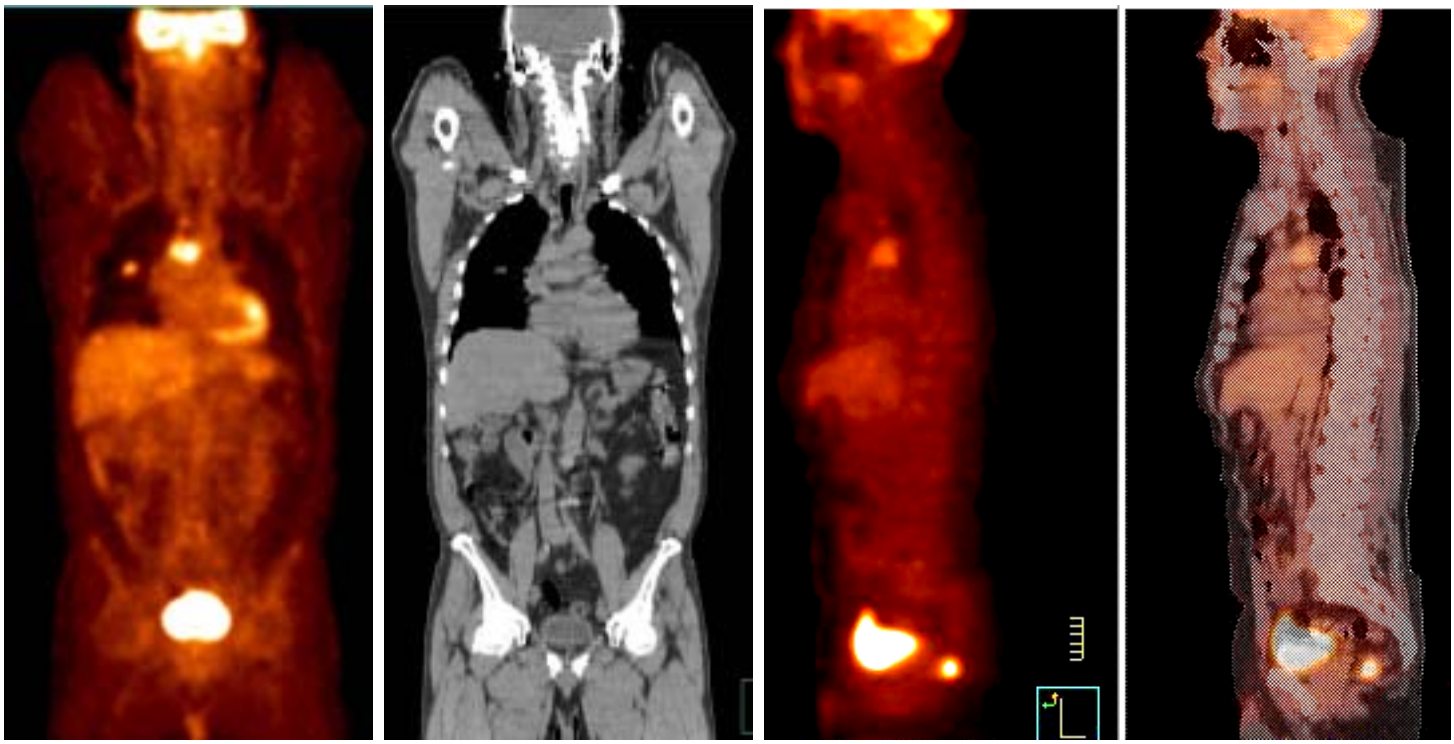
Figure 4: Coronal and sagittal PET/CT images of a patient who was referred to our center for radical radiation therapy of the lung. In addition to the lung primary and nodal involvement, PET imaging detected a new second primary of the rectum.



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Medical Physics Research a Hit with Oscar!

Submitted by Michael Patterson, Juravinski Cancer Centre and McMaster University, Hamilton, ON

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OSCAR WIN ANIMATES RESEARCHERS

By STEVE BUIST, The Hamilton Spectator

Call it a case of art imitating life. Or in this case, art imitating light, to be more precise. A scientific paper analyzing the behaviour of light written 12 years ago by two Hamilton cancer researchers has helped a California computer science professor win an Academy Award for revolutionizing the field of animation.

When Mike Patterson and Tom Farrell developed a complex mathematical formula for their work in the field of medical physics, they never dreamed that one day their ideas would come to life on Hollywood's silver screen. Gollum from Lord of the Rings, Dobby from Harry Potter and the Chamber of Secrets, the Hulk - they can all trace their lifelike appearance on the big screen back, in part, to the findings of Patterson and Farrell. "We never would have thought of this application, that's for sure," said Patterson, head of the medical physics department at Hamilton's Juravinski Cancer Centre.

The story dates back to 1992, when the two cancer researchers published a paper in the journal Medical Physics. One of the main research areas at the Juravinski site is to develop highly-specialized ways of using light to diagnose and treat cancer, so it's important for Patterson and Farrell to know how light interacts with the human body. When light hits a hard surface, such as a piece of steel, the photons will either be absorbed or bounce right back off the surface, like a tennis ball hit against a wall. But scientists learned that with objects such as skin or the leaves of a plant, some of the photons will actually penetrate a little beneath the surface, bounce around like a pinball off certain structures and then shoot back out somewhere else. In fact, researchers can shine light on to one point of the skin and then use special instruments to measure how much of the light is escaping from the skin at some other point. Patterson and Farrell's paper developed a mathematical model that could be used to calculate how photons bounce around just below the skin's surface.

Fast forward almost a decade, when Farrell gets an e-mail asking him some very technical questions about the math contained in the 1992 paper. He thought it was curious, but the pair were just happy to know that anyone was still paying attention to their earlier work. "Then Tom gets another message that says 'By the way, do you know that your paper is quite famous in the animation world?'" said Patterson. Umm, no, they didn't. "We never expected that at all," added Farrell. "You do something with a goal in mind and you're really thinking of applications in closely-related fields."

It turns out that on the other side of the continent, a Danish-born computer science professor at the University of California-San Diego named Henrik Jensen had been trying to figure out ways to make computer-generated images appear more natural and lifelike. Jensen made about 50 trips to the university library looking for answers, eventually stumbling on the 1992 paper by Patterson and Farrell. Almost immediately, he realized the significance of their discovery in relation to his own work. "They had the key insight," said Jensen. "It was the final piece of the puzzle for me."

To make computer-animated "human" characters appear more lifelike, Jensen recognized that you needed to take into account the scattering of photons just beneath the surface of the skin. "I was quite surprised that you'd have to be that sophisticated to simulate appearance," said Patterson. Jensen adapted the Hamilton scientists' formulae into his own research, and published his own paper in the fall of 2001, called "A Practical Model for Subsurface Light Transport."

The motion picture industry quickly latched on to Jensen's novel approach and began incorporating his work into their own computer software for animation. A year after Jensen's paper was published, movies were already being released using his ideas. The results can be seen in the final two installments of Lord of the Rings, Harry Potter, The Incredible Hulk and the third installment of the Terminator series. In recognition of his contributions, Jensen was honoured with one of the technical Oscars handed out by the Academy of Motion Picture Arts and Sciences. It's one of the few times that the Academy has honoured an academic outside of the motion picture industry.

Jensen, meanwhile, graciously deflected some of the credit to Hamilton's two cancer researchers. "They can take a lot of pride in that," Jensen said. "They certainly have a share in the award." Two weeks before the big star-studded Oscar party on February 29, the Academy handed out its technical awards at a smaller ceremony in Los Angeles. It just happened to fall on February 14 - Valentine's Day. "They had to find a day when technical people had free time," Jensen deadpanned. Jensen was actually informed in December that he would be awarded a Technical Achievement Award. "They tell you ahead of time that you're getting a prize to encourage people to show up for this one," Jensen joked. "It also leaves you enough time to buy a tuxedo." While he did get to walk down a red carpet like the Tom Hanks and Julia Roberts of the world, Jensen has one small lament. "I don't even get any free movie tickets," he joked.

AQPMC 2004 Meeting

Submitted by Michael Evans,
McGill University Health Centre, Montréal, PQ

On Saturday May 8, the Association Québécoise des Physicien (ne)s Médicaux Cliniques (AQPMC) met for its sixth annual meeting in Sherbrooke. The AQPMC is a professional association that represents medical physicists primarily employed in health care institutions. At the time of the meeting there were 56 members, and about 35 were able to make it to the meeting in Sherbrooke. Medical physicists from Gatineau, Montréal, Trois-Rivieres, Quebec, Sherbrooke and Chicoutimi attended. Currently most AQPMC members are associated with radiation oncology or medical physics departments. The meeting consisted of two components: a scientific session in the morning, and a business meeting in the afternoon. There were six presentations in the morning, including:

Ballista : une alternative en planification inverse pour la radiothérapie externe; F. Beaulieu, D. Tremblay et L. Beaulieu (CHUQ),

Socrate : un logiciel maison d'organisation pour un service de radio-oncologie; Luc Ouellet (CHUS),

Comparaisons entre des champs statiques à 6 MV (9 champs) et 18 MV (7 champs) pour le traitement de la prostate (CHRTR, présenté par Dominic Gélinas),

IMRT au CHUQ; Luc Gingras et Bernard Lachance (CHUQ),

Technique de correction de l'effet des divergences en radiothérapie externe des seins; André Bertrand (CHUS),

and Évaluation du premier système de chargement automatique d'aiguilles : Isoloader; Janelle Morrier, Mario Chrétien, Nicolas Varfalvy et Luc Beaulieu (CHUQ, présenté par Mario Chrétien).

Following a lunch the business meeting took place. Reports from the executive (President, Secretary and Treasurer) were presented as well as the election of outgoing officers. Reports from the various committees including Ethics, Professional Affairs, Communications, and Technology were tabled. In addition members from the AQPMC were invited to comment on the various Quality Assurance documents being developed by CAPCA (The Canadian Association of Provincial Cancer Agencies), and a report by our committee was presented at the Sherbrooke meeting.

The AQPMC is actively involved in the creation of a professional order within the health sector and there was a report from this committee to the general membership. The efforts to create a professional order for medical physicists parallel various changes in the provincial laws governing health sector responsibilities. The AQPMC feels that we must play a more active role in deciding which professionals have responsibilities for the delegation of professional acts such as calibration, dosimetry and treatment planning to name a few. The creation of a professional order is one manner in which our profession can become both recognized, and legitimately invited to participate in these discussions which will no doubt affect our manner of practice. The AQPMC is recognized as the negotiating unit for medical physicists employed in the health sector, and as such plays an active role in salary negotiation. There was discussion regarding both salary and working conditions, and the committee for salary negotiations was re-activated.

A mid-year workshop is planned for November 2004 at the department of radiation oncology at the Maisonneuve-Rosemont hospital in Montreal. This workshop is planned as a "hands-on" activity and will concentrate on QA aspects in radiation oncology. The workshop is a new venture for the AQPMC and its format and frequency are still being developed. The AQPMC has quickly evolved into an active and professional group since its humble beginnings around a picnic table at a COMP meeting in London, Ontario in 1998. While the AQPMC remains by its nature small in numbers, the membership is committed to its success, and is willing to volunteer for committee work to enhance the medical physics profession in the province. There are logistical problems in running a small professional group over a large region, however the annual meeting remains an enjoyable method to re-acquaint colleagues from across the province and to re-charge our batteries for another year of defending our profession. The AQPMC website is : viva la difference!

Chinese Radiation Oncology

Submitted by Peter Munro,
Varian Medical Systems, Palo Alto, CA, USA

I had the opportunity to visit China to present at a Varian's Users' Group Meeting held in conjunction with the Chinese National Radiation Oncology meeting in Shenyang, China. The meeting, which is the Chinese equivalent of the CARO or ASTRO meetings, is held every four years. Last year, because of SARS, the meeting was cancelled and rescheduled for this year. The attendance at the meeting has been steadily increasing demonstrating the development of radiation oncology in China. Two meetings ago attendance was ~400 people, the last meeting attendance was ~800 people and this year attendance was approximately ~1200 people. This is quite impressive given that there are only ~4000 radiation oncologists in China. The meeting was almost exclusively attended by radiation oncologists because of severe shortages of physicists in the country. Hospital physicists are relatively poorly paid and little appreciated (does this sound familiar?) so there are relatively few medical physicists in China. While this has not hampered the growth of radiation therapy so far, the physicians that I talked to thought that the clinical implementation of IMRT would be delayed by these shortages.

The conference schedule consisted of user's meetings on the 21 May 04, an all day plenary session on the 22 May 04 - consisting of invited talks from mostly North American invitees (including Jean Pouliot from UCSF) - and then proffered sessions for another 1-1/2 days. While I was able to get a program for the plenary session, I was not able to get a program for the proffered talks. Many of the speakers in the plenary sessions were speakers who had been sponsored to present at the commercial user's meetings the previous day.

I was quite surprised at the apparent youthfulness of the attendees. While the average age at a CARO or ASTRO meeting appears to be someone who has been in practice for a while (~40-45), the average attendee at this meeting looked much younger(~30-35). It appeared to me (and this was confirmed by some discussions) that radiation oncology is a young and developing field with many radiation oncologists being recent graduates. The youthfulness of the profession suggests that radiation oncology may develop rapidly in China.

The meeting was held in Shenyang, the fifth or sixth largest city in China with a population of ~6 million people. The capital of Liaoning Province, Shenyang was the home of the Qing (pronounced Ching) dynasty, the dynasty that took control of China in the 1600's and ruled until China became a republic after the Second World War. Shenyang is ~ 950 km north-east of Beijing and approximately the same distance north of Seoul. The area is more familiar as Manchuria – home of the Manchu people. Shenyang boasts a Forbidden City built around 1625 – a smaller earlier version of the Forbidden City that the Qing dynasty rulers later built in Beijing and the Fuling Tomb, final resting place of Nurhachi, the emperor who founded the Qing dynasty.

I had the opportunity to visit the Fang Liao - the radiotherapy department - of the Liaoning Cancer Hospital, one of two major radiotherapy facilities in Shenyang. The center boasts three Varian linear accelerators, the oldest ~10 years old and the most recent ~3 years old. However, regular updates to the accelerators and to the computer systems running the radiotherapy department made the department look like a brand new clinic - certainly as modern as any new Canadian radiotherapy centre. In some ways the centre was a study in contrasts. Cleanliness, at least of the floors in the waiting rooms was abysmal, making the waiting rooms appear like they were part of an 1800's era hospital. The waiting areas were also unadorned - one or more rows of plastic chairs in an bare room – apart from a TV blaring Chinese soaps. At the same time, patients were checking in using bar coded cards and a computer running the check-in software of Varis/Vision. And the treatment areas themselves were clean, free of clutter, filled with the latest computer hardware including flat panel monitors and with a simple, adorned appearance. The centre had designed and built its own swinging shielding doors. The doors had had a shiny chrome finish, closed in ~ 10 s, had optical sensors to identify the location of the door, and had been designed to eliminate pinch hazards. Had the doors at the LRCC been so elegant in their form and function, I am sure the move to door-less bunkers would not have occurred in Ontario. And even though the radiotherapy department was located on the first floor, the ceilings were extremely high (~4-5 m) giving an open and inviting appearance to the treatment rooms.

There were many obvious differences between Canadian and Chinese radiation therapy. One of the most obvious was the unimportance of patient privacy. We were invited to walk into the treatment rooms, even though patients were still on the treatment couch in various states of undress. And patients would ready themselves in an anti-room immediately adjacent to the control area. So while one patient was getting off of the treatment couch, the next patient was already in the treatment room ready to get on the couch as soon as it was free. This definitely increased patient throughput. Each machine typically

(Continued on page 100)

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Inscrivez-vous ou obtenez plus de renseignements en consultant www.medconnexions.ca dès aujourd'hui! Vous pouvez aussi communiquer avec nous par courriel à medconnexions@cma.ca ou par téléphone au 800 663-7336 ou au 613 731 8610, poste 2231.

IAEA Creates "PACT" Fundraising Fund To Fight Cancer

Submitted by Ken Shortt, International Atomic Energy Agency, Vienna, Austria

Radiotherapy treatment is crucial for a majority of cancer patients but most people in developing countries simply cannot access it. The IAEA has set up PACT -- "Programme of Action for Cancer Therapy" -- to take radiotherapy to where it is most needed. The IAEA's Board of Governors backed the PACT plan at its meeting in Vienna 14-18 June 2004. It paves the way for the IAEA to seek and direct funds from individuals, charitable trusts, foundations and the public and private sectors to help patients in poor countries fight cancer. The World Health Organization (WHO) has welcomed the initiative.

Cancer kills more people than AIDS, tuberculosis and malaria put together. A single radiotherapy machine can deliver nearly a million treatments during its 20 to 30 year lifespan. But the need is enormous. The number of cancer patients in the developing world is set to double, from 5 million in the year 2000, to nearly 10 million per year by 2020.

Through PACT, the IAEA will build partnerships within and among countries, and with other United Nations organizations, like WHO, and other non-UN bodies. With enough support, the programme could save or improve the quality of millions of lives each year.

IAEA Director General Mohamed El Baradei told the Board that, "a large deficit exists in equipment and staff in developing countries that prevents many patients from receiving appropriate radiotherapy treatment." PACT "seeks to increase our capacity to assist Member States in providing cancer treatment and care, working in conjunction with the World Health Organization and others, mainly by expanding our fundraising efforts with non-traditional donors," he said.

The IAEA has a long track record of providing essential equipment, and training staff to safely treat cancer patients. It has delivered over $57 million of radiotherapy technology to developing Member States since 1981.

Ethiopia, Ghana, Mongolia, Namibia and Uganda would not have radiotherapy facilities without the IAEA's support. PACT will expand these efforts to improve cancer control programs according to the priorities and needs of the countries and regions concerned. For more information on contributing to the fund please contact: Mr. Bhadrasain Vikram, IAEA Division of Human Health, and Mr. David Kinley, IAEA Division of Public Information, for details.

NOTE: If you are interested in further information or working with the IAEA, please check out the website (www.iaea.org) or contact Ken Shortt directly (k.shortt@iaea.org).

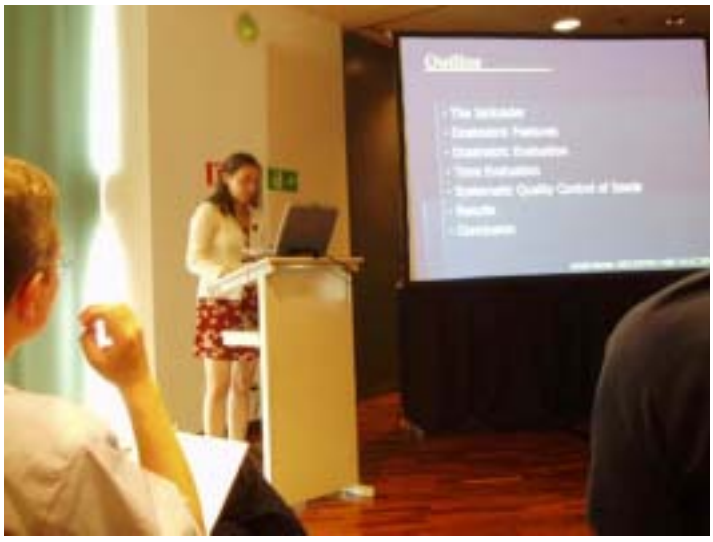
3rd Joint Brachytherapy Meeting

Submitted by Luc Beaulieu,
CHUQ - Hôtel-Dieu de Québec, Quebec City, PQ

The 3rd joint brachytherapy meeting was held in Barcelona in Spain from May 13-15. A pre-meeting workshop sponsor by Nucletron was also held on May 12th. All major brachytherapy organizations were represented: American Brachytherapy Society, Groupe Europeen de Curiethérapie (GEC-ESTRO) and the Group Latino-America de Curietherapia (GLAC). According to the organizers, they were over 650 participants (close to 800 if the exhibitors are included), which accounted for the largest brachytherapy meeting ever. The Canadian community was well represented with a total of 19 presentations for the most part from Ontario and Quebec, with six of them from physicists. The meeting had a good mix of prostate LDR and HDR, cervix, breast, gynecology and head and neck. The first day of the meeting was devoted to a workshop on advances in image-based brachytherapy, going over the use of ultrasound, CT, MRI, and MRSI for the various brachytherapy sites. Related issues to the image-based volume definition were also tackled such as dose volume parameters and constraints. Contouring uncertainties (the culprit being CT) were also widely discussed.

As for Barcelona, the city of Gaudi, it is quite a lively city. You first have to get used to the "tapas" at 18h and dinner starting at 21h-22h! The food and the weather were excellent. Both the workshop dinner (May 12th) and the Canadian dinner by the Mediterranean were appreciated.

Included below is a photo of Janelle Morrier, a physics student of mine, during her oral presentation in a physics session at the meeting. Janelle will be working as a medical physicist at the regional cancer center of Chicoutimi on May 31st.



From the Editor

Unfortunately, our intended feature-article author had to pull the plug on their contribution for this issue. This happens occasionally, and I think we can all relate to those situations when we have too much on our plates (I'm not trying to hang anyone here!) . However, I would like to remind everyone that the regular feature article provides very important content for the newsletter. If I approach you for a feature article, please give it serious thought. Your colleagues will appreciate it!

Thanks to Kathy Mah, Curtis Caldwell, and Parminder Basran, we still have a very interesting main article to enjoy in this issue. They were preparing the "PET/CT Simulator" for submission, and I appreciate the extra effort they put in to make the July issue deadline. For the record, their article was not intended as a research-based 'feature article', but as a clinically focused piece.

In the coming issues, there will be a new column dedicated to bringing you the latest information and developments from institutions across Canada. This is an effort to keep your colleagues up-to-date with local happenings, and to track all of you! I will attempt to be as inclusive as possible, covering diagnostic, nuclear medicine, magnetic resonance, and cancer treatment facilities, primarily based on the COMP membership. The content will be reasonably brief, only a few paragraphs, so it will not be a burden to produce. The rotation cycle (time period between submissions from one institute) will be approximately 2-3 years. I will begin contacting people for this next month.

Finally, a special thank you to everyone who came to the COMP meeting in Winnipeg this past June. We hope you all had a great time! It is clear to me now that I would rather travel to the meeting than host it….. hosting is far too much work!! Look for an article on the COMP meeting in the next issue.

Have a great summer!

Boyd McCurdy

Chinese Radiation Oncology (Continued from page 98)
treated ~50 patients per day, but this was accomplished in an eight hour period. The treatments themselves generally appeared to be simpler than Canadian treatments. Only one of the accelerators had an MLC, and I saw several fields without any field shaping.

Overall, I was very impressed by my visit. Although the treatments were relatively simple, the staff appeared to be competent and conscientious, and a large number of people were receiving care. Given the youthfulness of the radiation oncologist population, and their enthusiasm to try new techniques, it appears that the future of radiation therapy in China is quite promising.

Canadian College of Physicists in Medicine
Chief Examiner's Report 2004

Katharina Sixel,
Toronto-Sunnybrook Regional Cancer Centre, Toronto, ON

Membership Examination 2004

23	**Candidates**
20	in Radiation Oncology
1	in Magnetic Resonance Imaging
1	in Diagnostic Radiology
1	in Nuclear Medicine
16	Passed written exam
7	Failed written exam
70%	Pass rate for written exam
16	eligible candidates for oral exam
12	passed oral exam
75%	pass rate for oral exam
52%	overall pass rate

Pass candidates: Parminder Basran, Slobodan Devic, Robert Doucet, Keith Furutani, Robert Hunter, Ian Kay, Kyle Malkoske, Boyd McCurdy, Siobhan Ozard, James Scott, Michael Tassotto, Collins Yeboah

All successful candidates were elected Members of the Canadian College of Physicists in Medicine at the Annual General Meeting on June 13, 2004 in Winnipeg..

Fellowship Examination 2003

3	**Candidates**
1	in Radiation Oncology
2	in Magnetic Resonance Imaging
1	Pass
2	Fail

Pass Candidates: Giles Santyr

All successful candidates were elected Fellows of the Canadian College of Physicists in Medicine at the Annual General Meeting on June 13, 2004 in Winnipeg.

Congratulations to all new Members and Fellows and Welcome to the College!

On behalf of the CCPM, I thank all Invigilators and the Examination Committees of written and oral Membership exams, and of the Fellowship Exams. The exam process would be impossible without the participation our members.

CMA-CCA 2004

Submitted by Michael Evans, McGill University Health Centre, Montréal, PQ

Over the weekend of March 27-28 I was in Ottawa as the CCPM General Assembly Delegate to the Canadian Medical Association's Conjoint Committee on Accreditation (the CCPMs GAD to the CMA's CCA!).

As a reminder the CCPM is a sponsoring member of the CMA - CCA. This is the body that conducts accreditation visits for various medical technology training schools across Canada. As many medical physicists are involved with the teaching and training of technologists and therapists in both diagnostic imaging and radiation oncology, it is advantageous to have the CCPM represented at this process. During the meeting we reviewed the activities of the CCA during the last year and completed the nomination process for the executive of the CCA and the Committee on Program Accreditation (COPA). Dr. Andrew Rainbow is a CCPM member incumbent to the COPA however I believe his term ends next year.

Over the same weekend I also attended the symposium sponsored by the Association of Canadian Community Colleges (ACC) and the Canadian Association of Allied Health Programs (CAAHP) entitled "Clinical Education: Challenges and Strategies". This conference was attended by about 200 delegates from teaching related professions and much of the symposium dealt with challenges related to both clinical teaching and the placement of students for their clinical training. The subject was in part a response to the increasing difficulty schools have in finding clinical rotations in either hospitals or clinics for their students to complete their national competency profiles (similar to training requirements). The symposium also described many innovative ways teaching facilities have developed to improve clinical teaching. Some of these included Web-based course teaching, data management techniques and various simulation tools used by fire departments and paramedics, the military, and air-ambulance personnel among others. A plenary session was followed by 11 speakers with a recap synthesis of the day given by the plenary speaker. The speakers talks are generally available on the ACCC website (acca.ca), however many of the problems alluded to by this group will ring true with medical physicists involved in teaching environments. Hospitals being under ever increasing financial pressure don't see the need to invest either money, space or time for the training of medical professionals, and yet these are the very same institutions that rightly complain about the lack trained staff. It was pointed out that for most training programs such as radiology or radiotherapy technology there is a well known 60:40 rule. The didactic costs associated with the classroom teaching account for about 60% of the costs of training and the financing of this is well known. On the other hand nobody is really sure how the 40% it costs to place technologists in a clinical setting to complete their competency profile requirements is paid for, or who assumes this cost. This was an interesting conference to attend both as a physicist involved in teaching technologists, but also as someone who is involved with our own Medical Physicist Residency program here at McGill University. Of course we only deal with a few residents at any one time, but many of the problems are the same despite the difference in scales.

In addition Dr. Rainbow and myself have been nominating names of physicists to act as members of accreditation teams that conduct site visits. These names are forwarded to the CCPM executive who then pass them along to the CMA-CCA. My experience has been that the CMA is very happy to have CCPM physicists participate both at the executive level and in site visits For example, in April I will be visiting the University of Prince Edward Island school of Diagnostic Imaging as part of a team of 4 surveyors for an accreditation visit. The other members include a radiologist, a program co-ordinator from another school and a Senior Manager of the CMA-CCA head office. The site visit takes about five days including travel. These visits take a fair amount of work prior to travel, including a review of background documentation (hundreds of pages) and several telephone conferences. On the other hand I have found the site visit to be a good learning experience, and have been teamed up with other members who have completed 10 or more site visits each and are able to lead the review. The expertise required to be a "Scientist" reviewer is not enormous, and teaching experience is probably more important. CCPM is fortunate to be able to play a role in this accreditation process as it certainly increases our visibility with "cousin professions" such as imaging and therapy technology.

The following CCPM physicists names have been accepted to the CMA-CCA roster list of site surveyors (hopefully this won't come as a complete surprise to all of you!):

MRI: BRONSKILL, DICKOF, NAHMIAS.

Nucl. Medicine: BRONSKILL, DICKOF, MAWKO, RAINBOW, WELLS.

Rad. Therapy: ARSENAULT, DICKOF, EVANS, LEWIS, RAINBOW.

Rad. Technology: DICKOF, EVANS, MAWKO, RAINBOW.

Hmmm - as I always suspected apparently there is nothing Peter Dickof can't do! If you would like to volunteer your name to be on the roster list of site visitors as a scientist, simply contact Dr. Brenda Clark and state your area of expertise. The area of expertise can be somewhat peripheral. For example both of my visits have been to accredit diagnostic imaging programs although I work as a radiation therapy physicist. The overlap is more than adequate.

I believe this is now my eighth year as the CCPM delegate and I am probably more than two years past my normal term limit. Although it has taken most of that time for me to figure out what all the acronyms stand for and just what exactly is going on, I think it would be a good time for someone else to take over as the CCPM representative to the annual meeting of the CMA-CCA. This meeting is held once a year in Ottawa, so having someone close by will certainly make things cheaper for the CCPM (sorry - my mother doesn't seem to want to put up the next delegate). I believe that the CCPM sponsorship of this activity is good for our profession, and will benefit anyone involved with teaching programs, either at the technologist or physicist level.

I thank the CCPM for their confidence in me over the last 8 years as their representative and wish my successor much luck. I will be glad to pass on any knowledge I have gleaned, and can even offer advice on parking in downtown Ottawa!

ACCREDITATION: An Idea Whose Time has Come?

Submitted by Brenda Clark and Ed McCullogh,
Vancouver Cancer Centre, Vancouver, BC and Mayo Clinic, Rochester, MN, USA

Whether dealing with a service provider, a repair person or fellow medical staff, we all demand appropriate knowledge and skills to accomplish the tasks expected. Furthermore, as medical physicists we have a special appreciation of the need and importance of peer review.

Individuals who train for any profession need to acquire at least the following three fundamental attributes:

1. knowledge of terminology and principles of the field,
2. the ability to perform all associated procedures with a very high level of competency and
3. the ability to extrapolate existing knowledge and procedures to solve unforeseen problems or to add to existing knowledge.

Simplistically, we can consider that a medical physicist obtains each of these attributes from the following:

1. a graduate program in medical or radiological physics
2. a clinical residency in medical physics, training associated with a graduate degree or a carefully mentored on-the-job training program (OJT)
3. the completion of a Ph.D. thesis, genetics or carefully mentored OJT.

The gray hairs amongst us remember fondly the days of old when the knowledge and procedures were rather uncomplicated and in fact were very repetitive and technician oriented. Coincidentally, these were the days when there were "mixed" residencies in "Radiology" where one year working in a radiation therapy department gave a physician some ability to cure cancer with radiation. The field of Radiation Oncology woke up in the late 1960's to the realization that indeed it was a specialty substantially different from Diagnostic Radiology. Furthermore the field required three years of training which later increased to four. This has proven to be the correct decision as the technical, clinical and academic aspects of the specialty have increased exponentially. The basic premise is that no longer was a minimal one-year rotation plus OJT adequate training to reach a guaranteed competency level. Knowing medicine and "radiology" was not good enough.

It is no stretch of the imagination to say that medical physics now finds itself in the exact same situation. How can it be argued a degree in physics (or "allied" physical science) plus a highly variable OJT experience turns out anyone that we would want to hire to take care of our family members. We certainly would not want our brains explored by an MD with some OJT.

In the early 1990's, the AAPM, ACMP and ABR formally recognized what many of us who conduct oral board exams have groused constantly about, i.e., that many candidates have limited exposure to even the most fundamental knowledge and skills associated with clinical medical physics. This recognition led to the formation and incorporation of the Commission on Accreditation of Medical Physics Education Programs, Inc. (CAMPEP). The aim was to establish some minimal guidelines and provide peer-reviewed accreditation that a given graduate education or residency program had met these guidelines. The guidelines (available from www.campep.org) are designed to ensure a comprehensive and appropriate level of quality for the program and the "stamp" of accreditation is meant to convey to a prospective student, the program's institution, potential employers and certification/licensing bodies that there is a very good chance (not 100%) that the graduate of such a program would receive (has received) thorough, high level and documented training.

Currently, there are 11 graduate education programs and 7 clinical medical physicist residencies accredited by CAMPEP. Although very creditable, clearly there is a question that should be asked as to why there are many programs with good reputations which have not to date sought accreditation. The accreditation process involves the generation of a self-study which, although admittedly onerous at first glance, basically consists of a 20-25 page document plus appendices and which allows the institution, maybe for the first time, to describe and consider all aspects of the program. An on-site visit is conducted to validate the information in the self study. A physician is frequently included in the site visit team for a graduate program and always in a first visit to a residency program. The repective committee of CAMPEP reviews the recommendation of the site visit team and passes their recommendation on to the CAMPEP Board. The CAMPEP board consists of 8 members representing the current four sponsoring organizations: AAPM, ACMP, ACR and CCPM.

We hereby propose that accreditation of Medical Physics training programs is an idea whose time has come and furthermore is the only way our profession can quality assure training of it's members. Take it away and we regress to the Physicist plus "wild-west" OJT mode which helps neither the entrant, potential employers nor the patient. In fact take it away, and we become less vigilant at all levels than our medical colleagues who look to us for true knowledge, skills and the integration of both.

The giving of credit for graduation from a CAMPEP accredited program by certification bodies has now evolved into a proposal that medical physicists emulate their physician colleagues in that entrance to board exams be only granted to graduates of CAMPEP accredited programs. In a field where the demand will exceed the ability of such programs to supply, great consternation abounds. The board exam cross-correlation is however not the real issue; the pertinent issue is the expansion of formal training programs. The profession has failed miserably in supporting this partly because there have been an adequate number of very smart and savvy individuals who came into the field when it was simple and who grew with it. In today's economic and litigious climate, this should be perceived

(Continued on page 104)

ICCR 2004

**Submitted by Michael Sharpe,
Princess Margaret Hospital, Toronto, ON**

Canada was represented "from coast to coast" at the 14th International Conference on the use of Computers in Radiotherapy (ICCR), which convened in Seoul, South Korea, from May 10-13, 2004. This unique gathering has taken place every three or four years, with the sponsorship of an academic institution in the host city. For most of us in the field, its hard to image radiation oncology physics was ever practiced without computers! In spite of it's anachronistic name, the ICCR continues to be a terrific barometer of the progress and emerging trends in technical research and development directly related to our field. This year's meeting was no exception, with invited and proffered papers highlighting several major maturing and emerging trends. For example, image-guided treatment using computed tomography, "four-dimensional" CT imaging for respiration gated treatment, and functional imaging in treatment planning. Related work was presented on deformable image registration and automated tissue segmentation. Several papers dealt with refinements in IMRT, including direct optimization of machine parameters or aperture shapes and tomotherapy delivery. Dose calculation algorithms and Monte Carlo dosimetry continue to be well represented at the ICCR as well.

Local Organizing Committee Chair, Byong Yong Yi, and his team deserve high praise for putting together a stimulating and well organized program of scientific presentations and social events. The medical physics profession is relatively new to South Korea, but it is clearly one of the fastest growing communities in the world, and we should all look forward to supporting and watching the
profession develop there.

If I imagine what the next ICCR will look like, I'd predict that functional imaging like PET-CT and MR will be more commonplace, and automated segmentation of normal tissues will be maturing. There will be growth in the area of adaptive treatment planning, and perhaps the beginnings of a "renaissance" in clinical radiobiology.

Speaking of the next ICCR, I would like to take this opportunity to invite you all to Toronto for the 15th ICCR in 2007. This meeting will be sponsored jointly by the University of Toronto and University of Western Ontario. We aim to organize a stimulating scientific program, along with memorable social events. Please pencil it in tentatively for June 4-7, 2007. The date and venue to be firmed up over the summer. We hope many of you will plan to participate!

"Top 40 under 40" List Includes David Jaffray

**Submitted by Michael Sharpe,
Princess Margaret Hospital, Toronto, ON**

One of Princess Margaret Hospital's Radiation Medicine Program's own is one of Canada's Top 40 Under 40: Dr. David Jaffray, Head of the Radiation Physics Department, has been recognized for his leadership in the development of image-guided radiation therapy.

This national program celebrates and honours the leaders of today and tomorrow who have reached a significant level of success but have not reached the age of 40. They are our role models for young Canadians.

Achievement in the following areas are considered:

- Vision and Leadership
- Innovation and Achievement
- Impact
- Community Involvement and Contribution
- Growth/Development Strategy

Dr. Jaffray was selected from more than 1,400 nominations. The complete story is included in an edition of the magazine Report on Business, included in the Globe and Mail, Apr. 30.

Based on an article in the UHN Intranet News.

Accreditation *(Continued from page 103)*

as an ill-fated strategy. We can do better than minimally accountable and possibly incomplete on-the-job training. Let's stop whining and complaining and start solving the problem. The future generations of our patients will thank us heartily for this watershed moment. Let's become the experts we claim to be instead of self appointed ones!

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Medical Physicist
Capital Health, Halifax

Let's build a healthier world

Capital Health, Atlantic Canada's largest academic health care organization, is recruiting a **Medical Physicist** for the Radiation Therapy Program at the QEII Health Sciences Centre site, Halifax, Nova Scotia.

Capital Health is one of Canada's major tertiary care facilities and is closely integrated with the Dalhousie University Medical School. Cancer research at Dalhousie is undergoing significant growth due to a recent $12 million donation.

The Medical Physics Department provides medical physics services at the QEII, the Cape Breton Cancer Centre in Sydney, Nova Scotia and at the Prince Edward Island Cancer Treatment Centre in Charlottetown. This position is based in Halifax.

The QEII is equipped with four Varian accelerators with MLC, Portal Vision and Varis. Selectron LDR and HDR units are in use as well as a superficial x-ray machine. There are active stereotactic radiosurgery, intravascular brachytherapy and total body radiation programs. Implementation of IMRT is underway using both micro-multileaf and conventional multileaf collimation. Simulation is carried out on a Picker AcQsim CT system. We are in the process of replacing a cobalt unit and a conventional simulator with an additional Varian 2100 EX accelerator and a Varian Acuity Simulator. Planning systems include Theraplan Plus, Nucletron and BrainLAB BrainSCAN. Fully equipped electronics and machine shops provide clinical and research support. The Sydney facility is equipped with two Varian accelerators, a Varian simulator, a Theraplan Plus planning system and a GE Advantage Sim workstation. The PEI facility has a Varian 2100 EX accelerator, a cobalt unit, a GE CT-Simulator and a Helax-TMS Planning system.

The salary scale for Radiation Oncology Physicists in Nova Scotia is very competitive with any Canadian Province. Certified physicists (MCCPM, DABR, DABMP) are placed on a nine-step physicist scale, which includes salary incentives for those who have their FCCPM, Ph.D. or both.

We invite you visit the following links to learn more about Capital Health, the QEII, Halifax and surrounding areas: www.cdha.nshealth.ca/facilities/qe2hsc , www.cdha.nshealth.ca, www.medicine.dal.ca, www.region.halifax.ns.ca

Halifax, with a population of 350,000, is small enough to allow you to live within easy reach of both your work and the beauty of the many lakes and ocean vistas nearby, and large enough to have a full spectrum of educational, cultural and recreational resources.

To pursue this opportunity please contact Human Resources, 1278 Tower Road, Halifax, Nova Scotia, B3H 2Y9 Phone: 902-473-5757 or Fax: 902-473-8499
E-mail: jobs@cdha.nshealth.ca (Please quote requisition #7143)

The deadline for the receipt of applications is **July 9, 2004**.

For further information please contact Mr.Jason Schella, Interim Chief Physicist, Cancer Care Program, Capital Health. E-mail: jason.schella@cdha.nshealth.ca Phone: (902) 473-6011.

The University of Alberta Department of Oncology and

The Cross Cancer Institute Invite Applications for

Medical Physicist (Full or Associate Professor)

A senior academic medical physicist position is available in the Division of Medical Physics, Department of Oncology, University of Alberta, and the Department of Medical Physics, Cross Cancer Institute (CCI). The applicant should have a Ph.D. in medical physics with CCPM certification or the equivalent (ABR, ABMP). The level of the appointment and the amount of guaranteed research time will be commensurate with the qualifications of the candidate. It is expected that the position will be at the Professor or Associate Professor level. The candidate will be expected to establish an independent research program at the interface of imaging with radiation therapy and/or other areas of research.

The CCI is the free standing comprehensive cancer centre situated on the University of Alberta campus, that serves the population of Edmonton and northern Alberta, providing tertiary level diagnostic and treatment services, conducting cancer research and participating in professional education.

The clinical facilities of the CCI include seven Varian linear accelerators, a cobalt unit, an orthovoltage x-ray machine, a CT-simulator, brachytherapy program, two conventional simulators (one to be replaced by another CT-Sim), advanced treatment planning systems, substantial electronic and machining facilities; comprehensive diagnostic, CT, MRI (1.5 T), SPECT and PET imaging systems. Developmental research includes IMRT planning, delivery, and verification; brachytherapy planning, megavoltage imaging detectors and image-guided adaptive radiotherapy. Clinical research includes participation in IMRT conformal radiotherapy clinical trials of the RTOG, clinical imaging, etc. There are strong links with the Experimental Oncology Division which provides expertise in molecular biology, genomics, proteomics, cell biology and imaging, biochemistry, and experimental therapeutics for cancer. Teaching responsibilities are within our CAMPEP-accredited medical-physics graduate program, the medical-physics residency program, the radiation oncology residency training program, and the in-house radiation therapist training school.

Major research facilities with laboratory space exists within the fully-funded Center for Biological Imaging and Adaptive Radiotherapy (CBIAR) at the CCI. Research facilities of CBIAR include a whole-body 3 T MRI/MRS system, Helical TomoTherapy, a 9.4 T MRI/MRS animal system, 2 PETS, a PET-CT, and an isotope-producing cyclotron with GMP capabilities.

Edmonton is in the heart of the Alberta parklands offering a wide variety of recreational activities, with the majestic Canadian Rocky Mountains a few hours away. The North Saskatchewan river winds it's way through Edmonton providing a stunning river valley with fully developed trails and parks. In addition, the combination of lowest provincial income tax, lack of provincial sales tax, and availability of modern amenities such as, the world's largest shopping mall and entertainment centre, make Edmonton a vibrant and attractive city in which to work and live.

Please submit a resume with the names of three referees to
B. Gino Fallone, Ph.D., FCCPM, DABR; Medical Physics, University of Alberta, Cross Cancer Institute, 11560 University Avenue, Edmonton, AB, T6G 1Z2, Tel. 780 432-8522, FAX 780 432-8615, ;gino.fallone@cancerboard.ab.ca.

RYERSON UNIVERSITY
TENURE-TRACK APPOINTMENTS IN PHYSICS

Ryerson University invites applications for tenure-track appointments in Physics with the Department of Mathematics, Physics and Computer Science in the Faculty of Engineering and Applied Science. Candidates should posses a Ph.D. in Physics or related area and have demonstrated both an excellent research record and a strong commitment to teaching. Preference will be given to those applicants with expertise either in medical physics (or related areas) or physics education research. The successful candidate is expected to attract external research funding and help in the development of new undergraduate and graduate programs in Medical Physics / Biomedical Engineering. One of these positions is targeted to begin on August 1, 2004, and is an equity position.

The successful candidate will join a dynamic team of medical physicists undertaking research in laser ultrasound and microwave thermal therapy, photodynamic therapy, ultrasound imaging, prostate brachytherapy, trace element detection in bone and computational modeling in biomedical physics. Recent investments by Ryerson University, the Canada Foundation for Innovation and the Ontario Innovation Trust have established Ultrasound and X-ray Fluorescence laboratories and the Facility for Research and Development of Minimally Invasive Therapies. The work is supported from agencies that include the Natural Sciences and Engineering Research Council, National Cancer Institute of Canada, Whitaker Foundation, Photonics Research Ontario, Premiers Research Excellence Award and Canadian Institutes of Health Research. A number of faculty members are appointed to local cancer centers and there exist opportunities to collaborate with these colleagues. Moreover, Ryerson is located within what City of Toronto has designated as the "Discovery District", home to seven world-renowned hospitals and more than 30 specialized medical and related sciences research centers.

As part of several new science programs at Ryerson University (which include degrees in Contemporary Science and Medical Physics), the Department is also seeking individuals with experience in physics education research or a demonstrated commitment to undergraduate Physics teaching and course development. In addition to their research, these individuals will be primarily responsible for course development, coordination and development of physics laboratories and experiments.

Salary is dependent on qualifications and rank of appointment, in accordance with the Ryerson Collective Agreement. Interested applicants should submit a curriculum vitae, a statement of teaching and research interests and the names of three references to:

Professor Alain Lan, Chair
Department of Mathematics, Physics and Computer Science
Ryerson University
350 Victoria Street
Toronto, Ontario
M5B 2K3

In accordance with Canadian immigration requirements, this advertisement is directed toward Canadian citizens and permanent residents of Canada. Ryerson University encourages applications from all qualified individuals including men, women, members of visible minorities, aboriginal people and people with disabilities.

CancerCare Manitoba is the provincial agency responsible for cancer control and blood disorders, including prevention, early detection, care and treatment, research, palliation and education throughout Manitoba. We invite applications for the position of:

Head, Radiation Protection Services

CancerCare Manitoba, Winnipeg, Canada
Medical Physics
Permanent Full-time Competition #: 28-04-71353041

An exciting career opportunity to manage a diversely oriented Radiation Protection Service has arisen due to a staff retirement within the Medical Physics Division at CancerCare Manitoba, Canada. The Radiation Protection Service comprises six technical/scientific staff plus the managing Head. The responsibilities associated with this position include planning, directing, controlling and reporting the work of the well-trained staff as well as performing the lead role in consultations and communications with a variety of stakeholders. The broadly based Medical Physics Division includes the service departments of Radiation Protection, Imaging Physics, Radiotherapy Physics, Nuclear Electronics, Medical Devices, Research & Education, and Administrative Support. The managing Head is expected to participate as a member of the Division management team and in the broader affairs of the operation of CancerCare Manitoba.

QUALIFICATIONS: Applicants at the Ph.D. level are sought who possess the characteristics of a good manager and communicator with a strong background in radiation-related sciences. A complete listing of qualifications can be found by pasting this address into your browser: http://www.cancercare.mb.ca/cgi-bin/hr_detail.smj.pl?row_id=23

CancerCare Manitoba is located in Winnipeg, a city of 700,000 inhabitants, which offers the best features of both small and large cities. A wide range of cultural, entertainment and sports activities is available. There are two universities, a large community college and a good school system. The city is close to Lake Winnipeg and the Whiteshell Provincial Park. Attractive, inexpensive housing can be found close to work, while other costs of living, such as electricity and automobile insurance, tend to be lower in Winnipeg than elsewhere in North America.

Further information about CancerCare Manitoba, Winnipeg, and its surroundings may be found at the following websites: www.CancerCare.mb.ca, www.manitoba.worldweb.com, www.city.winnipeg.mb.ca, www.gov.mb.ca/index.shtml and www.umanitoba.ca

Benefits include employer-subsidised pension and dental plans, life and disability insurance and a minimum of 4 weeks paid vacation.

CancerCare Manitoba acknowledges all forms of human diversity and respects the rights, dignity, pride and privacy of all persons. We provide a smoke free working environment.

Interested and qualified applicants are invited to submit a detailed and current resume by July 30, 2004 together with a covering letter stating the Competition Number to:

CancerCare Manitoba
Human Resources
675 McDermot Avenue
Winnipeg, MB R3E OV9

E-mail: jobs@cancercare.mb.ca or Fax: (204) 786-0181

We thank all that apply and advise that only those applicants selected for further consideration will be contacted.

CancerCare Manitoba is the provincial agency responsible for cancer control and blood disorders, including prevention, early detection, care and treatment, research, palliation and education throughout Manitoba. We invite applications for the position of:

Imaging Physicist

CancerCare Manitoba, Winnipeg, Canada
Medical Physics
Permanent Full-time Competition #: 29-04-8171421

The Division of Medical Physics at CancerCare Manitoba is seeking an experienced and enthusiastic Medical Physicist to join our Imaging Physics Service. This dynamic team of five provides support to Diagnostic Imaging Departments in seven Winnipeg Hospitals, including two teaching hospitals, and to Regional Health Authorities throughout the Province of Manitoba. The imaging inventory we support includes 16 CT scanners, four of them 16 slice, and five MR scanners. An additional MR will be installed shortly. There are six hospitals with Nuclear Medicine Departments with a total of 16 gamma cameras, most of them dual detector. A Biograph PET/CT system will be installed during this summer. Construction is expected to commence later this year on a new Research Institute building which will be the permanent home for the PET/CT scanner, a cyclotron and a new interventional MR unit.

Imaging Physics staff provide technical advice on the purchasing of imaging equipment, performing acceptance testing and develop and advise on QC procedures. We work closely with the Diagnostic Imaging Departments to give general assistance to the Clinical Imaging Service. An Accredited Physicist performs testing for the Accreditation of mammography units.

We are looking for a Medical Physicist with clinical imaging experience and/or a strong imaging research background, who will bring additional expertise to our Team. The exact field of work and the level of clinical vs research involvement will depend on the skills and experience of the successful applicant, but it is expected to include more than one imaging modality. The successful candidate will have excellent communication skills with the ability to work well with all levels of staff. The appropriate candidate will have opportunities for an academic appointment and for research, teaching and the supervision of graduate students. Full details can be found on our website at: http://www.cancercare.mb.ca/cgi-bin/hr_detail.smj.pl?row_id=24

CancerCare Manitoba is located in Winnipeg, a city of 700,000 inhabitants, which offers the best features of both small and large cities. A wide range of cultural, entertainment and sports activities is available.There are two universities, a large community college and a good school system. The city is close to Lake Winnipeg and the Whiteshell Provincial Park. Attractive, inexpensive housing can be found close to work, while other costs of living, such as electricity and automobile insurance, tend to be lower in Winnipeg than elsewhere in North America.

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We thank all that apply and advise that only those applicants selected for further consideration will be contacted.

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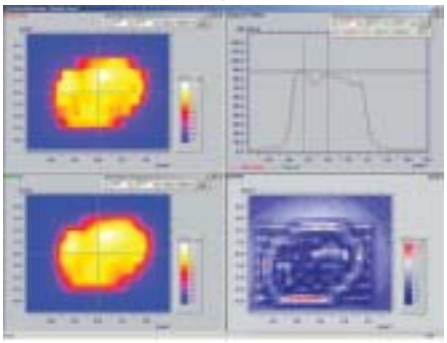

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