

PARTICLES

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PARTICLE
THERAPY
CO-
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GROUP

A **Newsletter** for those
interested in proton, light ion and
heavy charged particle radiotherapy.

Number 35

January 2005

Janet Sisterson Ph.D., NPTC

Costs: At PTCOG XIX, the Steering Committee decided that part of the registration fee for PTCOG meetings would be used to help produce both Particles and the abstracts of the PTCOG meetings. Only part of the costs is covered in this way, so more financial help is needed from the community. PTCOG is always happy to receive financial gifts; all such gifts are deductible as charitable contributions for federal income tax purposes. To learn how to do this, please contact Allan Thornton, the PTCOG secretary.

Facility and Patient Statistics: I continue to collect information about all operating or proposed facilities. Please send me your information. My latest **published** summary of the worldwide detailed patient statistics through 2001 is: "Status of Ion beam therapy in 2002." Author: J. M. Sisterson. In: Application of Accelerators in Research and Industry: 17th Int'l Conference, edited by J. L. Duggan and I. L. Morgan, 2003, CP680, American Institute of Physics. Copies are available on request. This summary was updated through 2003 and presented at the 18th International Conference on the Applications of Accelerators in Research and Industry, October 10-15 2004, it will be published in Nuclear Instruments and Methods in 2005.

Please join!!!! PTCOG Mail server: Niek Schreuder and colleagues at the Midwest Proton Radiotherapy Institute in Bloomington, Indiana have initiated this new service. Here is how to join:

You can email Niek Schreuder at aschreud@indiana.edu and ask to be added to the mail server referred to as the PTCOG_List. This they can do without having to join Yahoo. Better, however, is to join yahoo by getting a yahoo account and login - free of charge - and then join the PTCOG_list group – see instructions below. This will allow them to see previous mail communications and other advantages.

Here is a sample set of instructions.

"If you would like to learn more about the PTCOG_List group or join the group, please visit http://groups.yahoo.com/group/PTCOG_List. To send a message to all the members (after you have joined) simply send email to PTCOG_List@yahoogroups.com". Only members can post messages to the group. A member is defined as someone who's email address is in the yahoo PTCOG_List. To unsubscribe from this group, send an email to: PTCOG_List-unsubscribe@yahoogroups.com.

Particles on the Internet The web page for PTCOG and the Particles Newsletter is still at: <http://ptcog.mgh.harvard.edu>.

Other proton therapy links:

NPTC, MGH, Boston: http://cancer.mgh.harvard.edu/cancer_radonc_nptc_home.htm

LLUMC, California: <http://www.llu.edu/proton>

U of California, Davis: <http://crocker.ucdavis.edu/cnl/research/eyet.htm>

Midwest Proton Radiotherapy Institute: <http://www.mpri.org>

National Association for Proton Therapy: <http://www.proton-therapy.org>

TRIUMF, Canada; protons: http://www.triumf.ca/welcome/proton_thrpy.html

TRIUMF, Canada; pions: http://www.triumf.ca/welcome/pion_trtmt.html

CPO, Orsay, France: <http://www.protontherapie-orsay.fr>

PSI, Switzerland: <http://radmed.web.psi.ch>

TERA foundation, Italy: <http://www.tera.it>

Catania, Italy: <http://www.lns.infn.it>

GSI homepage: <http://www.gsi.de>

HMI Berlin: <http://www.hmi.de>

The Svedborg Laboratory, Sweden: <http://www.tsl.uu.se>

Clatterbridge Centre for Oncology: <http://ccotrust.nhs.uk>

Rinecker Proton Therapy Center, Munich, Germany: <http://www.rptc.de>

MedAustron: <http://www.medaustron.at>

ITEP, Moscow, Russia: <http://www.protontherapy.itep.ru>

Tsukuba, Japan - PMRC: <http://www.pmrc.tsukuba.ac.jp/index.html>

HIBMC, Hyogo, Japan: http://www.hibmc.shingu.hyogo.jp/english/aisatu-e_top.htm

HIMAC, Chiba, Japan: <http://www.nirs.go.jp/ENG/nirs.htm> (ENG case sensitive)

IThemba LABS, South Africa: <http://medrad.nac.ac.za/index.htm>

ARTICLES FOR PARTICLES 36

The deadline for articles for the Particles 36 is June 20 30 2005 and should **NOT** exceed two pages in length. Please send all articles to:

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Northeast Proton Therapy Center
Massachusetts General Hospital
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Telephone: (617) 724-1942
Fax: (617) 724-9532
E-mail: jsisterson@partners.org

PTCOG BUSINESS and FUTURE PTCOG MEETINGS

The Chairperson, Secretary and Steering Committee members are listed below. These appointments run through June 2007. In an effort to provide continuity to PTCOG, the position of Secretary is not limited to 3 years but the Secretary has no voting rights.

Chair: Alfred R. Smith Ph. D.
M. D. Anderson Cancer Center
Department of Radiation Physics
1515 Holcombe Boulevard
Houston TX 77030
E-mail: alsmith@mail.mdanderson.org

Secretary: Allan Thornton M. D.
MPRI
2425 N. Milo B. Sampson Lane
Bloomington, IN 47408
Email: athorn5644@aol.com

MEMBERS OF THE STEERING COMMITTEE

Canada	TRIUMF, BC	E. Blackmore
China	Wanjie, Zibo	L. Jiamin
France	Orsay	L. Feuvret
	Nice	P. Chauvel
Germany	GSI/Heidelberg	D. Schulz-Ertner
	HMI, Berlin	H. Kluge
	RPTC, Munich	J. Hauffe
Italy	Catania, Sicily	L. Raffaele
Japan	HIMAC, Chiba	H. Tsujii
	NCC, Kashiwa	T. Ogino
	PMRC, Tsukuba	Y. Akine
	HIBMC, Hyogo	Y. Hishikawa
	Shizuoka	S. Muruyama
	WERC	S. Fukuda
Korea	NCC, Seoul	J. Kim
Russia	ITEP, Moscow	V. Khoroshkov
	JINR, Dubna	Y. Luchin
	PNPI, St Petersburg	D. Seliverstov
South Africa	IThemba LABS	F. Vernimmen
Sweden	Uppsala	E. Blomquist
Switzerland	PSI	G. Goitein
UK	Clatterbridge	A. Kacperk
USA	NPTC-MGH/HCL, MA	S. Rosenthal
	LLUMC, CA	J. Slater
	MPRI, IN	
	UCSF, San Fransisco, CA	W. Wara
	M. D. Anderson, TX	A. Smith
	FTPI, FL	J. Palta

The times and locations of the next PTCOG meetings are as follows:

PTCOG 42	Tokyo, Japan Hosted by NCC, Kashiwa and Shizuoka Cancer Center	June 8 - 10 2005
PTCOG 43	RPTC, Munich, Germany	Fall 2005
PTCOG 44	PSI, Switzerland	Spring 2006
PTCOG 45	M. D. Anderson, Houston, TX, USA	Fall 2006

It was decided at the Steering Committee meeting that after 2006, there would be only one PTCOG meeting a year.

PTCOG 41 STEERING COMMITTEE REPORT Bloomington, Indiana, October 2004

Submitted by Al Smith, Chairman: alsmith@mdanderson.org

PTCOG 41 was held in Bloomington, Indiana, USA and was hosted by the Midwest Proton Radiotherapy Institute (MPRI) and the University of Indiana Cyclotron Facility (IUCF).

Honorary Members

Honorary Members of PTCOG are defined as those members who have made significant contributions to the field of Particle Therapy and have retired from full-time work. Previously elected Honorary Members of PTCOG have been Herman Suit, Michael Goitein and Kiyomitsu Kawachi. At the PTCOG 41 Steering Committee meeting, Bernie Gottschalk, Andy Koehler and M. R. Raju were elected as Honorary Members. In addition to our recognition of their worthy contributions, Honorary Members do not have to pay registration fees at PTCOG meetings. We hope that our Honorary Members, even though they are retired, will continue to attend PTCOG meetings and remain active in particle therapy – we need their advice and counsel.

Reorganization of PTCOG

During the PTCOG 40 meeting in Paris, the Steering Committee decided to reorganize into a more formal organization including the adoption of a mission statement, bylaws and membership categories/requirements. Additionally, it was decided that we would study available resources and develop recommendations for the process of becoming a legal international organization. Further discussions were held at the PTCOG 41 meeting. The Steering Committee is currently gathering information and will give a report of their efforts at the next PTCOG meeting. The Steering Committee invites PTCOG members to provide input into this process – please send your comments to Al Smith.

PTCOG Meeting Changes

After 2006, PTCOG will meet once each year rather than our current schedule of two meetings per year. Meeting organizers for all future meetings, starting with the June 2005 meeting in Tokyo, are strongly encouraged to provide education programs such as the in-depth course given at the Bloomington meeting by Bernie Gottschalk, “The Fall School in Basic Proton Therapy Physics”. The topics of these courses could rotate from meeting to meeting among the topics: Clinical Applications, Clinical Particle Physics, Radiation Biology, or Accelerator/Beam Delivery Technology. Ale Mazal will develop ideas for educational programs and share these with meeting organizers. The Steering Committee discussed the possibility of holding education programs separate from the annual PTCOG meetings starting possibly in 2007.

PTCOG meetings that are currently scheduled:

- June 8-10, 2005: Tokyo, Japan, hosted by the Japan National Cancer Institute and the Shizuoka Cancer Center
- Fall 2005: Munich, Germany, hosted by the Rinecker Proton Therapy Center
- Spring 2006: PSI, Switzerland
- Fall 2006: Houston, Texas USA, hosted by the M. D. Anderson Proton Therapy Center

The Steering Committee decided to postpone choosing meeting sites for 2007 and beyond until at least the Fall meeting in 2005 when we would have better information about new facilities coming on line.

Student Travel Awards

PTCOG will be approaching our Vendors about sponsoring student travel awards to PTCOG meetings. Students may apply for travel awards to be awarded according to guidelines being developed by a subcommittee of the PTCOG Steering Committee. Vendors will be given recognition for their participation and the subcommittee will develop suggestions for the Steering Committee as to the nature of the recognition. The tentative members (subject to their acceptance) of the Subcommittee for Student Travel Awards are:

- Michael Goitein, chair
- Skip Rosenthal
- Allan Thornton
- Fred Vernimmen

Skip Rosenthal will be developing ideas for vendor participation programs. PTCOG vendors are encouraged to give serious consideration to supporting the Student Travel Awards. We must begin to educate and train a cadre of young people who will develop and run the particle therapy facilities of the future.

PTCOG Secretary

A part-time (about one-fourth time) secretary for PTCOG will be hired from PTCOG funds. This person will be hired by MPRI from existing PTCOG funds that will be transferred to MPRI to support the salary. Additional funds (10% of meeting registration fees) will provide continuing support.

The secretary's duties will be:

- Publication of Particles
- Publication of meeting abstracts
- Keep "membership" and vendors lists up to date
- Provide information to meeting organizers
- Support the Steering Committee

Miscellaneous

- A PTCOG brochure will be developed by the MPRI team. The brochure will be placed at major radiation oncology meetings, perhaps in our vendor's booths, with their permission.
- The Steering Committee will develop a policy on vendor participation at PTCOG meetings.
- The Steering Committee discussed the issue of patents in particle therapy and the impact of patents on free information exchange. Realizing that patents are essential to protect intellectual property and to provide financial incentive for vendors, concerns were expressed about the potential of patents, pending patents, or patent intentions to stifle scientific and technical discussions at meetings. PTCOG had its beginnings in collective technical discussions and reports on aspects of particle therapy technology and it is important to the future of PTCOG that such discussions and reports are uninhibited, insofar as possible, by concerns that ideas and concepts freely expressed at meetings might be captured and used as patent material. To a considerable extent, the future growth of particle therapy will depend upon our sharing of collective experiences and ideas. We would benefit greatly by forming working groups to study specific technical problems and write reports on their findings, which would be shared freely among the PTCOG membership.

PTCOG Travel Fellowships

Due to the generous assistance of industry, PTCOG will be initiating a program of travel fellowships to assist beginning participants in particle therapy to attend PTCOG meetings. It is anticipated that some 15 to 20 such awards will be made annually and will provide in the neighborhood of €1'000 per fellow, and an additional approximately €500 for those who must travel between continents to attend the meeting. These awards will commence in time for the fall 2005 PTCOG meeting in Munich, Germany.

A candidate for a travel fellowship must be a person who:

- is at most 5 years beyond his or her highest degree and has at least one-half a year's, and at most 3 year's, experience in particle beam therapy;
- is a member of, or at least loosely affiliated with, an institution which must either: have, be building, or be in advanced stages of planning, a medical particle facility.
- and, whose institution will undertake to cover any additional costs of a fellow's attendance at the society's meeting.

Applications will be accepted from more than one candidate from any given institution. However, an effort will be made to have representation from as wide a geographic area as possible. Travel fellows will not be required to present a paper at the meeting.

Applications must be received by the beginning of the three month period preceding the meeting, and successful applicants will be notified at least two months before the meeting. The fellowship award will be given to the candidate at the time of registration at the meeting venue. Application forms may be requested by email at "michael@goitein.ch" or by fax to +41 56 442 5458 and should be addressed to the "PTCOG travel fellowship selection committee".

We wish to solicit support for the travel fellowship program from any interested company or individual. To date, only a few companies have been approached. We are happy to report that written commitments have already been received from IBA and Siemens, and that the program has been verbally accepted by three other companies. Additional sponsors will be eagerly welcomed.

members of the PTCOG travel fellowship selection committee:

Michael Goitein (michael@goitein.ch)

Skip Rosenthal (srosenthal@partners.org)

Allan Thornton (athorn5644@aol.com)

Fred Vernimmen (fv@sun.ac.za)

**PTCOG 42
Tokyo, Japan
June 8 – 10 2005**

The 42nd PTCOG meeting will be held on June 8-10, 2005, at the International Lecture Hall in the campus of the National Cancer Center, Tsukiji, Tokyo, Japan. National Cancer Center of Tokyo is located in the center of Tokyo, and many hotels, restaurants and shops are within several blocks.

Registration, housing information and abstract submission will be available in February – March 2005. Visit the web site <http://www.ptcog42.com> for complete details.

For more information, please contact:

Takashi Ogino (NCC, Kashiwa)

Email: togino@east.ncc.go.jp

This meeting is co-hosted the National Cancer Center, Kashiwa, by and the Shizuoka Cancer Center. We look forward to seeing everyone at Tokyo.

**Announcement of the
10th Workshop on Heavy Charged Particles in Biology and Medicine (HCPBM)
to be held in Italy, 15-19 June, 2005**

The TERA Foundation organizes the tenth HCPBM Workshop, which will be followed by the fourth (and last) Meeting of the European network ENLIGHT. Also the 1997 HCPBM Workshop was organized by TERA in Baveno (Lago Maggiore).

Following the same pattern used in Baden and Lyon, the event will begin in the evening of Wednesday 15 June, 2005, and will close at lunch time on Sunday 19.

The Workshop and the Meeting will take place in Oropa, a sanctuary since the XIII century, at 1200 meters of altitude on the Alps. Oropa is located twenty minutes from the town of Biella and ninety minutes from Milano-Malpensa airport, where buses will collect the attendees.

Information about the Oropa sanctuary can be found at www.santuariodioropa.it.

The invited presentations will focus on radiobiology for hadrontherapy on the first day, physics and treatment planning on the second day, clinical results and new projects on the third day to be followed by the final meeting of ENLIGHT. The presented posters will be discussed during dedicated sections.

For more information and/or registration contact the *Istituto Scientifico Europeo*, ISE by email (ise@tera.it) or at the website www.iseonline.it.

Ugo Amaldi

PTCOG Information/News/Reports:

The following reports and articles were received by January 2005.

The University of Texas M. D. Anderson Proton Therapy Center: Facility and Equipment and Installation Update
December 2004

The University of Texas M. D. Anderson Proton Therapy Center (MDA-PTC) is on schedule for opening in January of 2006 for patient treatments. All design reviews and factory tests of the proton therapy equipment, designed and manufactured by Hitachi Ltd., have been completed and substantially all of the hardware has been shipped to Houston, Texas for installation at the MDA-PTC site. Additionally, the treatment control and safety systems (TCS and TSS) have been tested at Hitachi's site in Japan using a simulator that was developed by Hitachi according to M. D. Anderson specifications. After satisfactory completion of the simulation testing, the TCS and TSS were shipped to Houston for installation.

Hitachi engineers, along with their sub-contractors, have installed the linac injector, synchrotron, beam lines and gantries. The alignment of the linac, synchrotron and beam transport system has been completed and the linac and the low energy beam transport beam line are being activated. The first beam will be injected into the 7 MeV linac and beam will be extracted from the synchrotron in March/April 2005.

All three rotating gantries are being installed. The major components of gantry 1 (undercarriage, front and back roller systems, cylindrical support sections, front and back rings, and the rear conical section) have been installed and the bending/transport magnets have been mounted. The x-ray tube/flat panel detector arms have been installed. The catwalk installation in gantry 1 is ninety percent complete and the catwalk installation in gantry 2 has begun. In gantries 2 and 3, installation of the undercarriage, front and back rollers, and support cylinders has been completed. Current installation work in the fixed beam treatment room includes laying ceiling plates for anchoring equipment, installing conduit and cable trays – the beam transport/bending magnets are in place. All four patient treatment rooms are currently on schedule and progressing with installation as planned.

Varian Medical Systems (Varian) is developing the treatment planning software for the MDA-PTC including passive scattering, discrete spot scanning (intensity modulation) and eye planning systems. Delivery of the first engineering version of the passive scattering system is scheduled for March 2005. IMPAC is developing the information systems for the facility and is working with Varian, Hitachi and M. D. Anderson to develop the interfaces necessary to integrate the treatment planning, machine shop, patient calibration and patient treatment systems. Initial testing of the IMPAC/Hitachi interface took place in November – additional testing will occur in December 2005. Interface testing will then begin on site in Houston with the installed IMPAC and Hitachi systems.

After internal testing by Hitachi, technical commissioning and acceptance testing will begin. Clinical commissioning of the first gantry and the large fixed beam line will begin in September 2005. M. D. Anderson will host a PTCOG meeting in October 2006 – the first announcement of this meeting will be made at the June 2005 PTCOG meeting in Tokyo, Japan.

Questions about the M. D. Anderson Proton Therapy Center can be directed as follows:

Technical: Al Smith - alsmith@mdanderson.org

Clinical: James Cox - jcox@mdanderson.org

Facility: Amy Hay - ahay@utmdaccptc.org

Program: Mitch Latinkic - mlatinkic@mdanderson.org

Questions about the Partnership that was formed to develop, fund and operate the PTC can be directed to:

Bruce McMaken bmcmaken@smhhou.com or John Styles jstylesjr@stylesco.com

Al Smith, M. D. Anderson Cancer Center, Dept. of Radiation Physics, 1515 Holcombe Boulevard, Houston, TX 77030.

1st Patient Treatment at the Wanjie Hospital Proton Therapy Center:

IBA is pleased to report that a first patient started treatment with the Proteus 235 installed at the Wanjie Hospital in Zibo (People's Republic of China) on December 20th 2004.

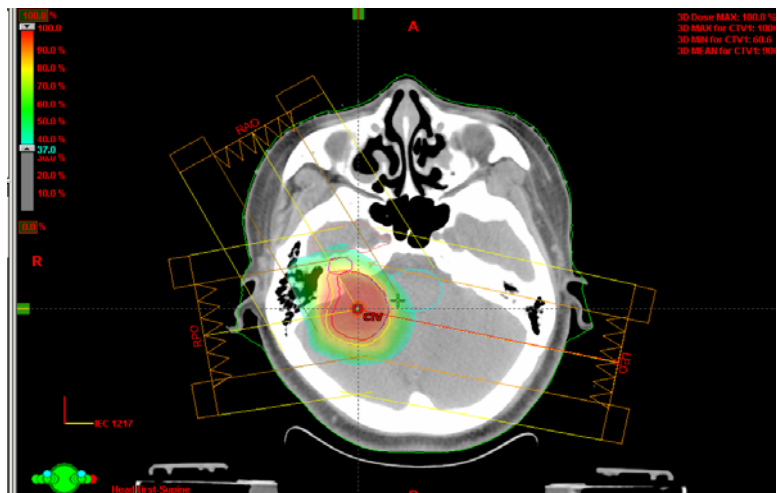
The patient is a 50-year-old woman with an Acoustic Neuroma (radius of +/- 1.5 cm). The treatment is planned over 25 fractions of 1.8 CGE, which will give a total dose of 50.4 CGE, using a double scattering technique on the fixed beam line just commissioned.

You can see on the TPS image the 3 fields of treatment. The Treatment Planning system used is the Varian Eclipse System.

This treatment was held just 3 years after the ground breaking and the start of building construction as originally planned. This achievement represents a substantial milestone for the proton therapy community, in terms of time reduction from order to clinical start up. It is the world first proton therapy system completed in 3 years.

A second patient started treatment a few days later. The ramp-up activity is expected to run smoothly over the following months.

The second treatment room, which is equipped with a Gantry, is currently undergoing validation. *Alain Bertinatti, Ion Beam Applications s.a., Avenue Einstein, 4, 1348 Louvain-la-Neuve, Belgium, Tél. : +32-10-47-59-07*



MedAustron – The Austrian ion therapy and cancer-research centre:

We are proud to announce that the Austrian Government approved the MedAustron project in October 2004. After years of intensive preparation we have finally attained a very important goal in our ambitions, the Austrian Government will contribute substantially to the investment and to the operation of MedAustron.

In the early 1990s Professor Meinhard Regler started an initiative to create an international research centre in Austria for the Central European Region. This project was named AUSTRON and was based on a pulsed neutron spallation source. In 1994 the AUSTRON Feasibility Study was published (editors P.J. Bryant, M. Regler and M. Schuster) which included the proposal for the implementation of a radiobiological facility. In 1995 MedAustron went its own way. A project office was founded in Wiener Neustadt, a town of 40'000 inhabitants which is located 50 km south of Vienna. The MedAustron Feasibility Study was published in 1998 (editors R. Pötter, T. Auberger and M. Regler). Two years later the Proton-Ion Medical Machine Study (PIMMS) was published at CERN. This study was initiated by Professor Meinhard Regler and Professor Ugo Amaldi and was headed by Dr. Phil Bryant of CERN.

In the year 2000 the Governor of the County of Lower Austria and the Mayor of the town of Wiener Neustadt decided to support the Design Study of MedAustron. A team consisting of forty interdisciplinary scientists, physicians, medical physicists and physicists defined the specifications for MedAustron and made a detailed design of the facility under the leadership of our medical project leader Dr. Thomas Auberger and myself. In 2004 the design study was published. After this book was presented to Austrian authorities it took just four months for the Government to declare its approval to the realisation of our project.

The mission of MedAustron always has been, and will continue to be, to create a “centre of excellence” in the fields of cancer treatment and cancer research. Furthermore we will provide a world-class irradiation facility for biomedical sciences, medical physics and physics which shall be accessible to national and international research groups which are performing basic science and industrial research. MedAustron shall be a centre for education and training of experts in ion therapy and it shall be the nucleus for further research activities.

A private investor will be selected via an “invitation to participate” which will be published world wide to finance, build and operate the centre. The investor will get a grant from the Austrian Government to cover a part of the investment and operating costs. Treatment costs will be reimbursed by health insurance providers in accordance with a new law voted by the Austrian parliament. The research beams will be operated by a scientific institute. It is our aim to create an institute of the Austrian Academy of Sciences for this research activity.

The operation of the facility will be divided into 60% for medical treatment and medical research and 40% for non-clinical research activities in the fields of physics, medical physics, biomedicine and technological industrial research.

The ÖGRO – the Austrian Society for Radiation Oncology – has supported the project from the beginning. In particular, the Universitätsklinik für Strahlentherapie und Strahlenbiologie of the University of Vienna (Head: Professor Dr. Richard Pötter) and the Universitätsklinik für Strahlentherapie of the University Innsbruck (Head: Professor Dr. Peter Lukas) were the driving forces for the advancement of the project. They published an epidemiological study which forecasts demand of more than 2'000 Austrian patients per year requiring for ion therapy.

This study demonstrates the need for four treatment rooms, two horizontal fixed beam-lines for protons and carbon ions, one proton gantry and one carbon ion gantry. The penetration depth in tissue varies from 3 cm to 27.5 cm. The beam size for the active scanning system is variable between 4 mm and 10 mm. Field sizes vary from 20×20 cm² to 40×40 cm² in the different treatment rooms. The patient positioning will be performed by means of patient couches in three rooms and a chair in the fourth room. Two treatment rooms are foreseen for the non-clinical research. One will be equipped for biological experiments and the other for physics experiments.

The technical design of MedAustron is based on PIMMS and has been updated for the medical requirements. The energy variation lies between 60 MeV and 250 MeV for protons and 120 MeV per nucleon and 400 MeV per nucleon for carbon ions. The required maximum beam intensity is 10¹⁰ protons per second and 4·10⁸ carbon ions per second. The beam is extracted from the synchrotron by means of the “third-order slow resonant extraction”, where the spill time can be varied from one half to ten seconds. The extraction line has a modular design and provides a beam quality that is identical in the six treatment rooms. A moveable rotator allows a one-to-one transformation of the beam cross section in the gantry rooms that is independent of the gantry angle.

The accuracy of all mechanical and electromagnetic systems for patient treatment has to assure an irradiation precision of less than 1 mm. The irradiation time accounts for a maximum of 7.5 minutes at a dose level of two Gray per fraction. On average a treatment cycle consists of 20 fractions. MedAustron is designed for the treatment of 1'200 patients (24'000 fractions) per year. Medical operation is scheduled during the working week in two shifts on 238 days per year. The non-clinical research in the two experimental rooms will be performed during the nights and the weekends, as it is usual for comparable facilities.

After a period of detailed planning, the construction of MedAustron will start in 2006 and the centre will be set into operation in 2009. We are very proud to have the chance to realize our vision in Austria!

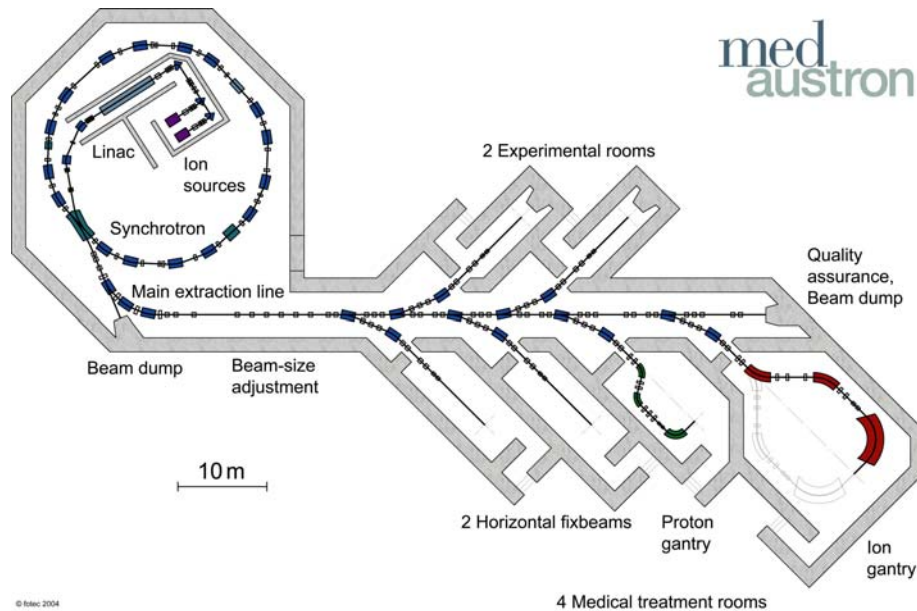


Figure: The layout of MedAustron consists of four medical treatment rooms and two experimental rooms. The core of the facility is the synchrotron designed by PIMMS. The two ion sources produce protons and carbon ions, respectively. The main extraction line has a modular design that provides identical beam qualities in all six irradiation rooms. The medical treatment rooms are equipped with two horizontal fixed beam lines, one proton gantry and one carbon ion gantry. The beam-size adjustment module allows a variation of the beam size at the patient of 4 to 10 mm.

Erich Griesmayer, Fotec – Forschungs- und Technologietransfer GmbH, Viktor Kaplan Strasse 2, Wiener Neustadt A-2700, Austria.

OncoLink: the largest website in the world for cancer information.

The website, at <http://www.oncolink.upenn.edu> currently gets 8 – 11 million hits per month making it one of the busiest healthcare sites in the world and an international resource for both physicians and patients. A dedicated section on proton therapy is being added to this website, which will certainly increase the visibility of proton therapy throughout the world. At the present time, this section is under construction and help is sought from all in the proton therapy community to make sure that we have the most pertinent, correct and up-to-date information as possible. Please visit the site, see what is there already and send me any comments or additional information. *James. M. Metz, Editor-in-Chief, OncoLink, University of Pennsylvania, 3400 Spruce Street, 2 Donner Bldg, Philadelphia, PA 19104, Metz@xrt.upenn.edu.*

History of the Harvard Cyclotrons

The Harvard Cyclotron Laboratory may no longer exist but Dick Wilson, Professor Emeritus, Harvard University has made sure that it will not be forgotten by establishing a web site which records the history of the Harvard Cyclotrons. The first cyclotron was sent to Los Alamos and never came back. Parts of it were in existence until recently. The second Harvard Cyclotron operated from 1949-2002.

The web-based history has many photographs, information and a list of all papers published by members of the Harvard Cyclotron staff over the years. Additional information can be added to this history at any time. The web site is: <http://phys4.harvard.edu/%7EWilson/cyclotron/history.html>.

In addition to this web based history, a small hard copy book (and in paperback), dedicated to Andreas (Andy) Koehler, has been published by the Harvard University Physics Department and is on sale at the Harvard University Press. <http://www.hup.harvard.edu/catalog/WILHIM.html>. This book can also be purchased through Amazon.com.

Janet Sisterson

TREATMENT PLANNING SYSTEMS FOR PROTON AND ION BEAM THERAPY

January 2005

The following Table is an extension of that originally presented in October 1999 by Skip Rosenthal, MGH at the Workshop on Treatment Planning Systems, PTCOG XXXI. Please send corrections/additions to Janet Sisterson.

Year	Created By	System Name	Status
1979-93	LBL	LBL system	Not Available
1980	MGH	Rx	Distributor MGH
1980	MGH	EYEPLAN	Distributor MGH – EYES only
1990-96	MGH/Seimens	V-Treat(AXIOM)	Not Available
198?,1991	PSI	PSI system/Pion	Distributor PSI
1995	DKFZ/Royal Marsden	Voxelplan/Proxelplan	Adapted by NAC, DKFZ
1996	Radionics/MGH/HCL	P-Knife	Not Available
1997	LLUMC/PerMedics	OptiRad 3D	FDA approved; commercial
1998	Tsukuba	Hitachi system	In-house system
1998	NCC/SHI	PTplan	In-house system
1998	DKFZ	OCTOPUS	Under development – EYES only
1994	Orsay/Curie	ISIS	Distribution ?
1998	CMS/MGH	FOCUS	Commercial Release 1999
1998	DKFZ	KonRad Plus Protons	Research Only
1989 – 2000	CCO, Clatterbridge, UK	EYEPLAN v1.6 (VMS)	Available free;eyes only; research only
1999	GSI	TRiP98	Research, Clinical, Scanned Ions
2000	Varian	Polaris	FDA approved for passive treatment modalities
2001	ITEP (Moscow)	ProGam	Adapted in PTF ITEP
2002	MDS Nordion	Helax-TMS	FDA approved: commercial
2002	CMS/Mitsubishi	FOCUS/M	Commercial Release 2001
	RenderPlan		?
	Adac		?
	Michigan		?

Proposed NEW FACILITIES for PROTON & ION BEAM THERAPY - January 2005

INSTITUTION	PLACE	TYPE	1 ST RX?	COMMENTS
PSI	Switzerland	p	2004	Addition of a 250 MeV cyclotron, 2 nd gantry, new 1 fixed
Rinecker, Munich	Germany	p	2005	4 gantries, 1 fixed beam, 250 MeV, scanning beams.
NCC, Seoul	Korea	p	2005	230 MeV cyclotron, 2 gantries, 2 horiz, 1 exp horiz.
FPTI, U. of Florida	FL, USA	p	2006	230 MeV cyclotron, 3 gantries, 1 fixed.
iThemba LABS, Somerset West	South Africa	p	2008	230 MeV, 2 gantry, horiz. + 30° beams.
M. D. Anderson Cancer Center	TX, USA	p	2006	250 MeV synchrotron; 3 gantries; 1 fix(2 beams)+1 exp rooms
Chang An Information, Beijing	China	p	2006	235 MeV Cyclotron, under construction.
Heidelberg	Germany	p, ion	2007	1 gantry; 2 fixed beam; p/carbon; int. contr. Raster scan
CNAO, Pavia	Italy	p, C-ion	2007	Synchrotron 400 MeV/u. 3 horiz, 1 vertical beam
Med-AUSTRON	Austria	p, ion	2009	p gantry; ion gantry; 1 fixed rm with p and C lines; 1 exp room
IMP, Lanzhou	PR China	C-Ar ion	2004?	C-ion from 100MeV/u and p (120 MeV) at HIRFL; clin. treat;biol. research; no gantry; shifted patients
Rinecker, Cologne	Germany	p	2008?	4 gantries, 1 fixed beam, 250 MeV, scanning beams.
Trento, Italy	Italy	p	2008?	cyclotron; 1 gantry; 1 fixed
CGMH, Northern Taiwan	Taiwan	p	?	250MeV synchrotron/230MeV cyclotron;3 gantry,1 fixed
Bratislava	Slovakia	p, ion	?	72 MeV cyclotron; p; ions; +BNCT, isot prod.
Erlangen	Germany	p	?	4 treatment rooms, some with gantries.
TOP project ISS Rome	Italy	p	?	70 MeV linac; expand to 200 MeV?
3 projects in Moscow	Russia	p	?	including 320 MeV; compact, probably no gantry
Krakow	Poland	p	?	60 MeV proton beam.
Proton Development N.A. Inc.	IL USA	p	?	300 MeV protons; therapy & lithography

WORLD WIDE CHARGED PARTICLE PATIENT TOTALS

January 2005

WHO	WHERE	WHAT	DATE FIRST RX	DATE LAST RX	RECENT PATIENT TOTAL	DATE OF TOTAL
Berkeley 184	CA. USA	p	1954	— 1957	30	
Berkeley	CA. USA	He	1957	— 1992	2054	
Uppsala (1)	Sweden	p	1957	— 1976	73	
Harvard	MA. USA	p	1961	— 2002	9116	
Dubna (1)	Russia	p	1967	— 1996	124	
ITEP, Moscow	Russia	p	1969		3785	Dec-04
Los Alamos	NM. USA	π^-	1974	— 1982	230	
St. Petersburg	Russia	p	1975		1145	April-04
Berkeley	CA. USA	ion	1975	— 1992	433	
Chiba	Japan	p	1979		145	Apr-02
TRIUMF	Canada	π^-	1979	— 1994	367	
PSI (SIN)	Switzerland	π^-	1980	— 1993	503	
PMRC (1), Tsukuba	Japan	p	1983	— 2000	700	
PSI (72 MeV)	Switzerland	p	1984		4182	Dec-04
Uppsala (2)	Sweden	p	1989		418	Jan-04
Clatterbridge	England	p	1989		1372	Dec-04
Loma Linda	CA. USA	p	1990		9585	Nov-04
Louvain-la-Neuve	Belgium	p	1991	— 1993	21	
Nice	France	p	1991		2555	April-04
Orsay	France	p	1991		2805	Dec-03
iThemba LABS	South Africa	p	1993		468	Nov-04
MPRI (1)	IN USA	p	1993	— 1999	34	
UCSF - CNL	CA USA	p	1994		632	June-04
HIMAC, Chiba	Japan	C ion	1994		1796	Feb-04
TRIUMF	Canada	p	1995		89	Dec-03
PSI (200 MeV)	Switzerland	p	1996		209	Dec-04
G.S.I Darmstadt	Germany	C ion	1997		198	Dec-03
H. M. I, Berlin	Germany	p	1998		546	Dec-04
NCC, Kashiwa	Japan	p	1998		300	Oct-04
Dubna (2)	Russia	p	1999		296	Dec-04
HIBMC, Hyogo	Japan	p	2001		483	Dec-04
PMRC (2), Tsukuba	Japan	p	2001		492	July 04
NPTC, MGH	MA USA	p	2001		973	Dec-04
HIBMC, Hyogo	Japan	C ion	2002		30	Dec-02
INFN-LNS, Catania	Italy	p	2002		82	Oct-04
WERC	Japan	p	2002		19	Oct-04
Shizuoka	Japan	p	2003		100	Dec-04
MPRI (2)	IN USA	p	2004		21	July -04
Wanjie, Zibo	China	p	2004		1	Dec-04
					1100	pions
					4511	ions
					40801	protons
				TOTAL	46412	all particles