Schweizerische Gesellschaft für Strahlenbiologie und Medizinische Physik
Société Suisse de Radiobiologie et de Physique Médicale
Società Svizzera di Radiobiologia e di Fisica Medica

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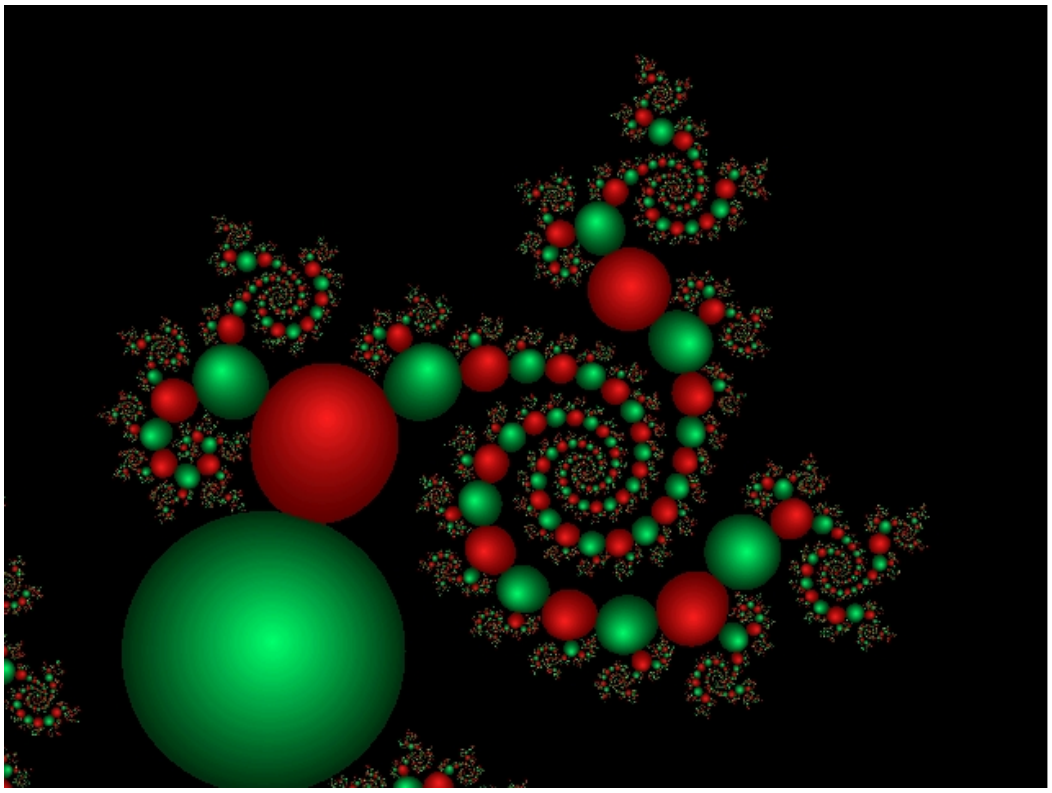

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BULLETIN 87

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Cover image:

Feeling Christmas-y yet? Well, how about a Christmas-y fractal to cheer you up! We chose this one from Prof. Sprott's vast (and quite amazing) collection! http://sprott.physics.wisc.edu/

LETTER FROM THE EDITORS

Dear colleagues!

Here we are again at the end of another year! It's time to look back over the year and recap all that happened in 2016 with the help of the traditional Annual Reports (Scientific, Education and Professional Affairs Committee), and especially with the President's Annual Report. These reports are not only a summary of the achievements and events of the (almost) past year, but also the starting point for looking forward to the coming new year.

Announcements for the Research Grant and the Varian Prize for 2017 are also in this issue.

A sad event of 2016 has been the loss of a treasured colleague, Dr. Michael Goitein. A brief obituary written in his memory by one of his closest colleagues, friend and even neighbor, reminds us how fortunate we were to know him and/or benefit from his work.

This Bulletin also offers an insight into the conferences and courses held at the end of the Summer (the ESTRO course and the first European Congress on Medical Physics - ECMP2016 – in Athens; and the SASRO meeting in Sursee), inspiring sweet memories and images of the bucolic landscapes of Greece, to warm us up in these first weeks of real cold.

Last, but not least, an extraordinarily rich Personalia page! You will be surprised by how many interesting new colleagues have just joined us! Included also is the list of candidates who passed the SSRMP exam this year and who are ready to take over their jobs with a new responsibility. A warm welcome and many congratulations to all of you!

Of course, we won't forget to thank all of the people who contributed to the Bulletin issues this year. Please, do not restrain yourself from sharing your experiences, discoveries and interesting findings with us; and also don't hesitate to offer your critical point of view! The Med Phys world definitely has room for improvements!

Finally, we members of the editorial team would like to wish all of you a Happy Christmas and a warm, full of fun and amusement, transition into the new year!

Francesca Belosi, Shelley Bulling, and Nathan Corradini

President's annual report 2016

Dear Colleagues,

It was in Fribourg, in October 2015, when the "new SSRMP year" started and when we had our last annual meeting. Again, I want to acknowledge the team of Fribourg, in particular Pierre-Alain Tercier, for organizing this excellent meeting. In the meantime, about 10 months later, we have to admit that it was a tough year with a lot of activities going on in our medical physics community. I try to recap some of them in my president's report, here.

Soon after the last year's annual meeting, the continuous education day 2015 took place on November 27, 2015 in Aarau. Gerd Lutters deserves many appreciations for organizing this important event. The topic was "dose from x-ray and nuclear medicine procedures" and it was definitely a highlight to learn and get insights from distinguished and renowned speakers.

During the last year, we had seven board meetings which, to my knowledge, is a record and means that we were sitting together almost every month. In addition, in the mentioned time period, we had two additional meetings with BAG and were organizing one AMP meeting. Throughout all these meetings we were rigorously focusing on the main and most important issues and were affected by hard but also productive dialogues. I am glad to see that the board members are actively working out profound solutions as a team. And I take the opportunity to thank all the board members for their efforts and their remarkable work over the last year. The discussions were certainly extensive considering not only the board members opinions, but we always tried to reflect our actions and decisions in a more general context. I can assure that during our meetings, we were always trying to include the ideas of the entire SSRMP society.

Definitely, the preparation of our feedback to the revision of the radiation protection ordinance was a major action point we had to deal with. We proposed on the last general assembly how to proceed with this important aspect. We decided to not perform this feedback preparation only within the board but to incorporate the member's statements by asking them to fill in a template and by organizing an AMP meeting in December 2015 in Bern. The AMP meeting was performed in a "workshop style", and helped enormously for the finalization of the board's feedback to the revised radiation protection ordinance. The feedback, eventually, was submitted on February 15, 2016 to BAG.

In the last year, the SSRMP board activities were not only concentrating on radiation protection ordinance revision but there were other challenging topics to manage. As a keyword list, I would like to mention:

- Support the organization of exams for SSRMP certification
- Answering different requests
- Research grant 2016
- Varian prize 2016
- Actively supporting SSRMP working groups
- Support to organize the joint meeting between SSRMP and SASRO in Sursee (August 25-27, 2016)

The SSRMP is organized by the existence of three permanent committees, and more details on the activities within these committees are given elsewhere. Nevertheless, it turned out

again in the last year, that this constitution is an excellent setup and helps the society to be productive and efficient. I just want to grant here the outstanding work by Jean-Yves Ray with respect to the arrangement and update of the website and the organization of the bulletin together with the bulletin editors. Together with Roman Menz and Stefano Presilla, he was also engaged with questionnaires and the subsequent conclusions. I also want to acknowledge the very important work of Frédéric Corminboeuf and Hans Roser in the education committee, particularly in bringing the new education guidelines into action. Moreover, it is a pleasure to see that our scientific contributions are recognized on both, national and international levels, and I would like to thank Raphaël Moeckli and the science committee for their efforts. As an example: the number of physics related abstracts for this year's annual meeting in Sursee, is greater than 50. But it's not only the pure numbers of abstracts which is rather high, it is also the fact that more and more authors from Swiss institutes are presenting their work in peer-reviewed journals with high impact factors.

In Sursee, on August 25, 2016, we are going to have our general assembly. I first would like to thank SASRO for helping us to jointly organize this meeting. Particularly, I would like to mention Günther Gruber and Rachid Boucenna for their support and their willingness to take over this challenge. On this year's general assembly, elections are taking place: new board members are replacing old ones. This gives me the opportunity to thank the board members who are stepping down. Daniel Vetterli entered the board in 2003 and was secretary since then. His protocols were always not only thoroughly written and on time but he also balanced out the two typical protocol's problems: write down everything or just write down decisions. I am happy to see that he managed that ambiguity in a very professional way. Hans Roser entered the board in 2010 and chaired the education committee since 2014. We are all very appreciative for his contributions and his clear and systematic ideas on many SSRMP aspects. And, finally, Werner Roser entered the board in 2001 and served as a treasurer since 2003. I don't exaggerate when I say that he's the living memory of our society. Unquestionably, he was the person to contact when we had to deal with something which might have already been discussed in former times, and we were sure: if Werner is not able to find it in his archives, no one would be. Many thanks for your thoughts and memories, Werner!

Looking to the next year, I see many challenges waiting to be solved. I look forward to the new board constitution which certainly will take over the corresponding tasks and will serve the entire SSRMP society with their best knowledge, with their valuable time, and with great respect.

Peter Manser, Bern, 25.8.16

2016 Report of the Scientific Committee

The scientific Committee is composed of Shelley Bulling, Marc Pachoud, Stefan Scheib and Raphaël Moeckli.

The committee evaluated the applications for the SSRMP research grant. Stephanie Ehrbar received the grant for her project about the "Development of a liver phantom for evaluation of radiotherapy treatments combined with motion mitigation techniques".

Thiago Lima ("Anerkennungpreis") received the Varian prize for an interesting paper published in Frontiers on Oncology: "Monte Carlo calculations supporting patient plan verification in proton therapy".

As in previous years, the different working groups had different levels of activity. I would like to thank all the working group participants for the time that they contributed to our society and to warmly invite anyone who is interested in joining a working group to contact the chairperson of the relevant group. The list of working groups and chairpersons is on our website (www.sgsmp.ch).

One AMP meeting took place in Bern on the 11th of December 2015 and was mainly dedicated to the discussion of the revision of the radiation protection ordinance. Lively discussions in small teams generated a lot of comments that were synthesized by the board (and mainly by Peter Manser!) and sent to the FOPH.

The 2016 SSRMP intercomparison was performed for the first time, and very well, by Claude Bailat and Thierry Buchillier (IRA). I thank them for this huge work. The participants have received their results and the synthesis of the global results.

We welcome your suggestions for future continuing education days, and look forward to receiving your ideas for new research projects.

Raphaël Moeckli, chair

2016 Report of the Education Committee

Since the start of 2016 new guidelines have been in effect (see webpage). Specifically, the entrance criteria for SSRMP medical physics specialisation has been clearly defined. Furthermore, candidates with an M.Sc in Med.Phys or a foreign certification must only sit for the oral examination.

We also published a new annex (Annex 01) which defines the equivalence of the B.Sc of physics.

On 27th November 2015, Gerd Lutters organised a continuing education day entitled "dose from x-ray and nuclear medicine procedures" in Aarau. The course was well-attended with 48 participants present.

In 2016, a further continuing education day was scheduled for November 30th in Bern with the topic: Monte Carlo Methods

We also tried to organise an education course on medical physics in nuclear medicine with the Unispital Zürich but we had to cancel it due to lack of participants. We aim to propose it again in the beginning of 2017 in Zürich.

In mid-November 2016, 23 candidates sat for the specialisation exams. Due to the large number of candidates, the exam organization had to be adapted. The exams were divided into 3 topics (clinical radiation physics, radiation physics and radiobiology & radiation protection) and included the presentation of a prepared subject.

Frédéric Corminboeuf

Report of the professional affairs committee SSRMP annual general assembly 2016

The revision of the radiation protection ordinances made the committee of professional affairs very busy and committed in organising the consultation throughout the society and in evaluating the revised texts themselves. A short survey conducted by the committee, querying the heads of medical physics, showed that only 30% of Swiss institutes would already fulfil the amount of resources as certified medical physicists proposed in the revision, namely "N+1". Fortunately, this percentage rises to 60% if the non-certified ones are included. As a matter of fact, this topic took our main attention and focus. The community's opinions about it were surely not unanimous. The board faced, indeed, a new challenge. We will have to learn and improve from this experience.

The committee for professional affairs also very much supports the community of medical physicists acting in the field of medical imaging being well-represented with two members, namely, Roman Menz and Stefano Presilla very active in that field, along with Hans Roser in the board. The committee has been involved in clarifying the task descriptions of the medical physicist upon a SSR-SGR request. This project involved the colleagues from the medical imaging physics (MIP) group. Moreover, in the framework of the activities of the MIP, the committee draws your attention on the very instructive professional status survey report which was published in Bulletin n°85.

A survey on professional information for medical physicists in Switzerland, namely the salary survey, will be conducted by the committee of professional affairs during spring 2017. The committee has begun revising the survey and its questionnaire with the aim to increase the response rate. We decided to further improve the surveying process by shortening the questionnaire, focusing on determinant parameters relevant for the work conditions of the medical physicist as an individual. We always took the anonymity of the process very seriously and with great care but we are aware that there were weaknesses to be improved, in particular in analysing and reporting the results. We gathered some remarks from selected colleagues but I invite you to get in touch with any of the committee's members, but in particular with Stefano Presilla, to share any of your restraints to participate to this periodic survey. We will do our best to include your input and thereby increase the participation rate.

Part of the committee is also the editor team which runs the Bulletin. The Bulletin depends on your contributions to maintain three issues per year. Please share your experiences, training courses and meetings by briefly reporting to the whole community. Your ideas for developing the Bulletin are greeted. A warm thanks to Francesca Belosi, Shelley Bulling and Nathan Corradini for their commitment.

Earlier this year, I called again for an enthusiastic volunteer to join the team for making the new SSRMP website lively; unfortunately without success. So please think about discussing your application with me. Nevertheless, I recently launched the second version of the newly designed website. For more details, check the related article in the Bulletin n°86. Until a web editor joins our team, I look after your publication requests. The board thinks we have now reached the aim of representing in a better way our society organised around its three committees. I hope the website will satisfy your expectations. Of course, your ideas and advice are always welcome.

Every year the president and the committee chairs ask for your volunteer participation and societal involvement because those activities make our society. I have also made it today, sorry about that. Instead, I would like also to confirm that already many and many of you, members, colleagues, are very active and usually in more than one activity. That had to be explicitly mentioned and the executive board acknowledges your high degree of commitment. I mentioned last year that our reaction was to involve more colleagues for distributing new additional duties. I think the board will have to tackle that problem in another way which must still be developed.

Let me finish with warm thanks to my committee team.

On behalf of the committee for professional affairs
Jean-Yves Ray August 25th, 2016

SSRMP executive board and permanent committees compositions

The SSRMP general assembly 2016 was held at Campus-Sursee on August 25. The executive board was renewed:

- **Peter Manser** was confirmed as President SSRMP
- **Frédéric Corminboeuf** was confirmed as chair of the committee for Educational Affairs
- **Jean-Yves Ray** was confirmed as chair of the committee for Professional Affairs
- **Raphael Moeckli** was confirmed as chair of the committee for Scientific Affairs
- **Roman Menz** was confirmed as board member
- **Stefano Presilla** was confirmed as board member
- **Yvonne Käser** was elected as new board member
- **Regina Seiler** was elected as new board member

With many thanks, Hans Roser (board member), Werner Roser (Treasurer) and Daniel Vetterli (Secretary) stepped down after several years of strong commitment to SSRMP.

On September 27, the executive board decided its members further appointments:

- **Raphael Moeckli** was confirmed as Vice-President
- **Roman Menz** was appointed as Secretary
- **Regina Seiler** was appointed as Treasurer

The composition of the permanent committees are as follow:

Educational Affairs
Frédéric Corminboeuf (chair)
Peter Cossmann, Stephan Klöck, Götz Kohler, Gerd Lutters, Regina Müller, Angelika Pfäfflin, Hans Roser and Valéry Zilio.

Professional Affairs
Jean-Yves Ray (chair)
Roman Menz and Stefano Presilla.
Bulletin editorial board: Nathan Corradini, Francesca Belosi and Shelley Bulling.

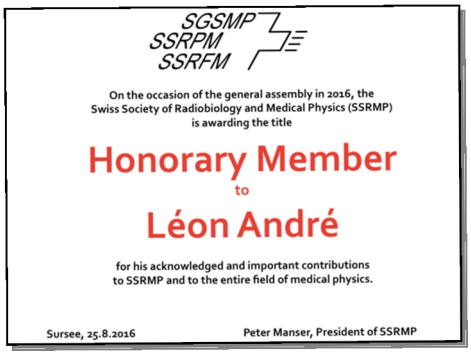
Scientific Affairs
Raphaël Moeckli (chair)
Shelley Bulling, Marc Pachoud and Stephan Scheib.
(Varian prize committee members have not been confirmed yet).

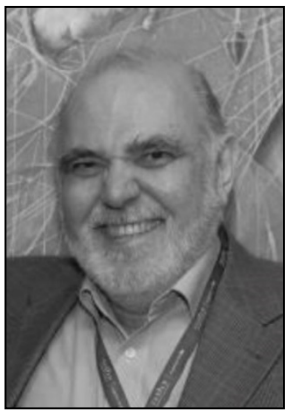
The board warmly thanks all these colleagues for their commitment to SSRMP.

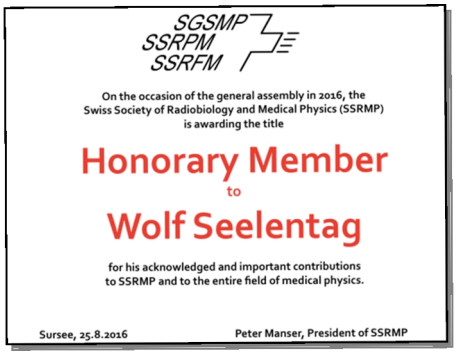
On behalf of the SSRMP board,
Jean-Yves Ray

New Honorary Members 2016

On the occasion of the general assembly on August 25, 2016 in Sursee, according to a proposal of the SSRMP board, three distinguished medical physicists have been named as new honorary members of SSRMP.







This is related to the recognition for their outstanding and important contributions to the activities of SSRMP.

We cordially congratulate.

Peter Manser,
SSRMP President

In homage to Michael Goitein

It was with great sadness that we learnt of the passing away of Prof Michael Goitein in August this year. Michael was a true pioneer in medical physics, particularly for his many contributions to both proton and conventional radiotherapy and, perhaps less well known, in the field of CT tomography.

Michael was, in many ways, a very typical Englishman from a very typical English Village. He grew up in Broadway, a beautiful village in the English Cotswolds, a delightful region of 'picture-book' England in the countryside between Oxford and Birmingham. However, he was also very much an English man abroad. After his university education at Oxford, the Sorbonne and then Harvard (not a bad set of educational institutes to have on your CV) he remained for most of his career in the US, where he did his PhD and quickly moved into the field of medical physics. Indeed, one of his first papers was a theoretical investigation into filtered back projection for CT reconstruction in 1972 – so around the time that Hounsfield and McCormack were also publishing their first work on tomographic reconstructions. Truly pioneering work I think.

However, he is probably best known to most for his work in radiotherapy and in particular, proton therapy. Indeed, it can be argued that the concept of the Beam's-Eye-View and Digitally Reconstructed Radiographs were first introduced by Michael, as well as the first use of cumulative dose-volume-histograms and the development of early biological models (although Michael would never take credit for these). Amazingly, one of the treatment planning systems he developed in the 1970's (EyePlan) is still in use today in the majority of ocular proton therapy facilities (including at PSI), and has been used in the successful treatment of tens of thousands of patients. Indeed, Michael's contribution to proton therapy has been immense, and the field would not be where it is now, and certainly not as widely practiced, without Michael's huge scientific contributions and firm belief in the clinical benefits of this modality.

After he retired from Harvard, Michael moved to Switzerland to be with his wife, Gudrun, and also become my neighbor. And although he continued to contribute to proton therapy in a consultative role, he started to devote his life more and more to family life, sculpture and poetry. And I guess we shouldn't be surprised at the latter. Michael was a word-smith from his very first publications, as shown by this short list of publication titles from his CV:

- **1. "Unsuccessful search for an excited electron"**
- **67. "Non-standard deviations"**
- **104. "Waiting patiently"**
- **151. "The cell's-eye view"**
- **152. "Swedish protons"**

as well as the book he wrote in his retirement – 'Radiation Oncology: A Physicists-Eye View'. If you haven't read this, then do. It was Michael's attempt to write a book about radiotherapy physics without using formulas, and is informative as well as being a great read. Scientific literature will be much poorer without such wonderful contributions.

But Michael wasn't just about science. On a more personal level, I was extremely privileged to know him as both a mentor and friend. He was always a massive inspiration for me, and was kind and caring enough to take me under his wing in the very early years of my career at PSI. His advice and guidance have been invaluable to me and my career, and it was a great privilege to know and work so closely together with him.

But it wasn't just work. I very well remember a trip together to Granada for an ESTRO conference (the first I had ever attended I believe) and his willingness to take a young, somewhat awkward, English guy along to some of the best places in the city. I very much appreciated this and have very fond memories of that trip. But this just underlines his fantastic hospitality and caring nature. It's that same nature that I guess motivated him to apply his outstanding physics skills to the world of medicine. Certainly, radiation oncology, particle therapy and medical physics would not be where they are now without his important and ground-breaking contributions.

Michael as a scientist, and more importantly as a human being, will be sadly missed.

Tony Lomax, PSI

Results of the Certification Exams in Medical Physics (SSRMP)

In the exams for the certification in medical physics SSRMP 2016 (4.-16.11.2016) the following colleagues succeeded:

From left to right:

Sara Alonso Arrizabalaga (KSA Aarau) in medical radiation physics
Alexandre Ba (CHUV Lausanne) in medical imaging.
Patrick Blumenberg in medical radiation physics
Chemseddine Fatnassi (Hirslanden Lausanne) in medical radiation physics
Sophie Harzmann (MVZ Lörrach) in medical radiation physics
Martin Hillbrand (München) in medical radiation physics
Maud Jaccard (CHUV Lausanne) in medical radiation physics
Konstantina Karava in medical radiation physics
Barbara Markert (KSM Münsterlingen) in medical radiation physics
Julien Ott (BAG Bern) in medical radiation physics
Fransesco Pupillo (EOC Bellinzona) in medical radiation physics
Izabela Pytko (USZ Zürich) in medical radiation physics
Anisoara Socoliuc Toquant (KSSG St. Gallen) in medical radiation physics
Patrizia Urso (Clinica Luganese Lugano) in medical radiation physics
Anais Viry (CHUV Lausanne) in medical radiation physics
Veronika Vitzthum (Inselspital Bern) in medical radiation physics
Lia Vugts (KSA Aarau) in medical radiation physics

On behalf of the examination committee and the SSRMP board I want to congratulate the candidates for their certification and the new position in the community connected to that.

Stephan Klöck, Zürich, 16.11.2016

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Swiss Society of Radiobiology and Medical Physics
Member of the European Federation of Organisations for Medical Physics (EFOMP) and the International Organization for Medical Physics (IOMP)

Results of the TLD Intercomparison for Megavoltage Units 2016

1. Introduction

The Institute of Radiation Physics (IRA) in Lausanne has been mandated by the Swiss Society for Radiobiology and Medical Physics (SSRMP) to organize an intercomparison. We took over from the medical physicists of St. Gallen Hospital the organization of these intercomparisons for the gantry driven linacs. The 2016 intercomparison followed the same procedure and used the same equipment to carry out the measurements as previous years. The aim was also the same i.e. to check the absolute dosimetry. For this time, we focused only on static photon beams.
Twenty-nine institutions took part to the intercomparison with a total of 117 beams checked, including 34 flattening filter free beams (FFF).
Similar to past audits, the requirement was to check each photon energy used in the institution only once. For example, if two machines are matched, only one machine had to be checked, similarly when two machines are equipped with a 6X beam, only one has to be checked.

2. Material and methods

The same TLD discs (4.5 mm diameter 0.9 mm, Harshaw Inc.) and solid water phantoms as those for the photon dosimetry of 2011, 2013 and 2014 have been used. The solid phantom was composed of two stacked Perspex phantom frames. The inner square was 4 cm in length, the outer square 10 cm x 10 cm. The frames have been filled with five plain RW3 (PTW Freiburg) slabs, and one slab containing three TLDs. The slab dimensions are 40 mm x 40 mm x 10 mm. The phantom was placed on Perspex or water equivalent material (at minimum 5 cm). This arrangement is shown schematically in
Figure 1. Each slab contains 3 TLD chips located on a circle 5 mm away from the centre.
The measurement depth in solid water was 5.55 cm. A correction was applied on the TLD reading to account for the slight difference between solid water and water. For this reason the user was asked to assume that the phantom was fully water equivalent and provided for sufficient scatter, as it would be the case in a large water phantom.
A TLD annealing oven and a Harshaw 5500 reader have been used, similarly to earlier intercomparisons. Thanks to our Co-60 irradiation facility, we could use a less time consuming procedure insuring the appropriate metrological traceability. We cross-calibrated the cobalt irradiator available at IRA against the Alcyon cobalt unit of METAS. This was achieved by means of two series of TLD, one irradiated in absorbed dose to water in the reference conditions at METAS and the other irradiated in the calibration laboratory at IRA. This allows us to prepare reference TLD at IRA for each series of measurements in the participant's beams. The procedure was adopted in agreement with Dr. Ch. Kottler from METAS.

The absolute dosimetry with TLD requires several corrections: non-linearity of the TLD response with dose, dependence of photon energy and fading effect. The non-linearity and fading corrections have been carefully determined at IRA. And for the energy dependence of the TLD response we have used the corrections carefully determined by the former organizers of these intercomparisons.
Finally, the correction associated to the replacement of the water phantom by the solid water phantom has been determined by direct comparison (carried out with an ionization chamber) at 3 beam qualities: Co-60 at METAS, and 6 and 18 MV at CHUV.
For the intercomparison irradiations, the measurement conditions in the solid phantom were as follows: source to surface distance 100 cm, field size 10 cm x 10 cm at the surface of the phantom, dose to the TLD close to 1.00 Gy.

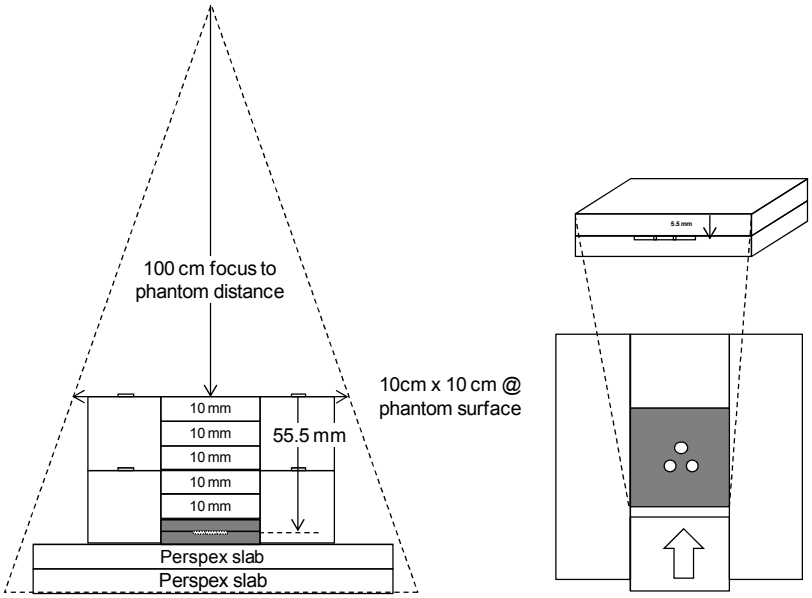


Figure 1. Assembly of the measurement equipment; phantom and (closed) phantom frame

Four runs of measurements were necessary for the 29 participants. For each one a calibration of all the TLD was carried out before and after the irradiation of the participant in order to determine the individual sensitivities of all the TLD chips. For each run, a series of 10 TLD in each group of 50 TLD were irradiated to the reference dose of 1 Gy at the cobalt irradiator on the date recommended to the participants. Then these 50 TLD were all read in a same batch and the dose delivered to every chip was calculated from the ratio of its indication to the mean indication of the references. Finally the corrections mentioned above have been applied.

3. Results

The agreement between the stated dose and the TLD measured dose is examined with the ratio "stated/measured" (noted D_s/D_m). An agreement within 4% is considered a satisfactory check.
After preliminary evaluation, one participant made a correction to the stated dose because the calculations were made for the isocentric setup instead of the SSD setup.
The obtained average ratio for the different beam types and energies is given in Figure 2 with the standard deviation. This repartition shows that all deviations from the unity can be attributed to statistical fluctuations.

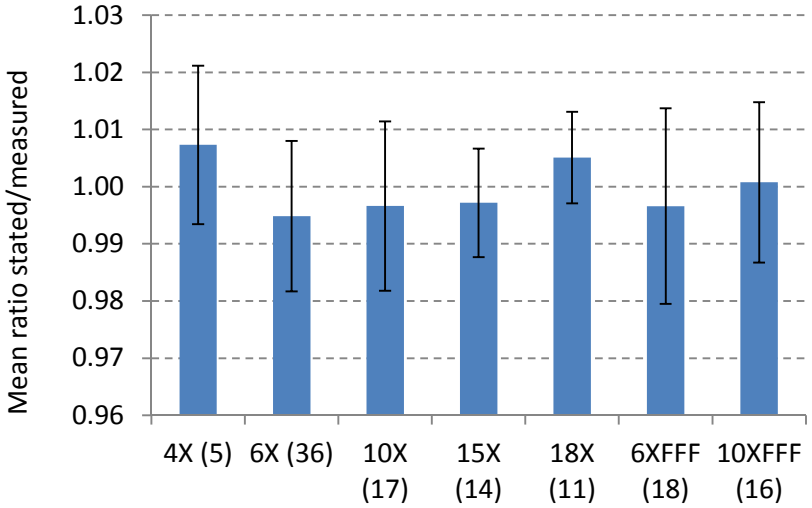


Figure 2. Mean Ds/Dm values for the different radiation qualities. The number of beams is given in brakets. Errors bars=std dev.

The distribution of the D_s/D_m ratio for all the beams is illustrated in Figure 3.

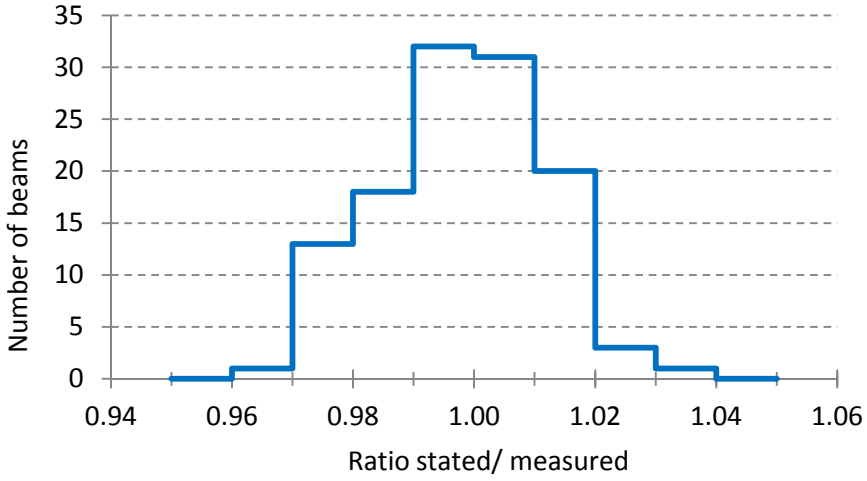


Figure 3. Histogram of Ds/Dm values for all 117 beams from the 29 institutions

The mean value of the D_s/D_m ratio for all the beams is given in Table 1.

Table 1. Ratio "stated dose/measured dose" (FF=conventional beams with flattening filter, FFF=flattening filter free beams)

Parameter	FF beams	FFF beams	Both types
Beam number	83	34	117
Mean	0.998	0.999	0.998
Std dev.	1.3%	1.6%	1.4%
Minimum	0.968	0.972	0.968
Maximum	1.030	1.032	1.032

The mean value of D_s/D_m, 0.998, is close to 1 and there is no measurable difference between FF and FFF beams. All results are in the interval 0.96-1.04, i.e. within 4%. And 93% of the results are in the interval 0.98-1.02, i.e. within 2%.

Uncertainties

The uncertainty on the dose determined using TLD includes the contributions due to positioning of the phantom in the beam, reading procedure of TLD with all influence quantities and reference in absorbed dose traceable to METAS for the cobalt irradiator at IRA. The uncertainty budget is given in Table 2. The contribution coming from the procedure with reference TLD and measurement TLD was determined using a statistical method. The fluctuations of the ratio of three measurement TLD over ten reference TLD were analyzed for five irradiations of 400 TLD.

Table 2. Uncertainty budget for the absorbed dose measurement with TLD. The contributions are given at the level of one standard uncertainty.

Contribution	comment	std unc.
Positioning	± 1 mm	0.2%
Cobalt irradiator calibration	-	0.65%
Stat. fluctuations of meas/ref.	type A eval.	0.6%
Non-linearity	all doses 1 Gy	0.05%
Energy response	type B eval.	0.5%
Fading	t < 3 days	0.10%
Effect of solid phantom	-	0.15%

The combined uncertainty was obtained by quadratic summation and amounts to 1.05% for each measurement with a slab containing three TLD, and 0.96% for the mean of two such measurements. For the expanded uncertainty we adopted only one figure of 2.0% (k=2) for simplicity.

4. Discussion and conclusion

The results of the 2016 TLD dosimetry intercomparison are good, all checked linacs meeting the satisfactory criteria of ±4% and 93% being within ±2%. For FFF beam we expected a slight underestimation of the dose with TLD as the chips are located 5 mm away from the centre due the sharp profile of such beams. In fact the results don't show any trend in this direction.

We thank all the medical physicists for their participation. Thanks to their excellent collaboration, we were able to respect the time schedule.

Thierry Buchillier and Claude Bailat 29.07.2016
CHUV - Institut de radiophysique (IRA)
Rue du Grand-Pré 1
1007 Lausanne

Tomotherapy dosimetry intercomparison 2016

Hans Schiefer, Konrad Buchauer and Simon Heinze; Kantonsspital St.Gallen, 9007 St.Gallen

It was the aim of the Tomotherapy dosimetry intercomparison of the year 2016 to check the absolute dosimetry. The cheese phantom setup, as established in the 2014 dosimetry intercomparison, was applied (Schiefer H, Buchauer K, Heinze S, Henke G, Plasswilm L, "Design and implementation of a "cheese" phantom-based Tomotherapy TLD dose intercomparison", Strahlenther Onkol. 2015 Nov; 191(11):855-861. Epub 2015 Jun 19).

1. Materials and Methods

If the 2014 or 2015 scan of the "cheese" phantom was still available, no further scan was needed. Analogous to the preceding two intercomparisons, the helical calibration plan with the high dose area in the center of the phantom - field width 2.5 cm – was used. No further planning was therefore needed.
Figure 1 shows the TLD and ionisation chamber measurement positions in the cheese phantom.

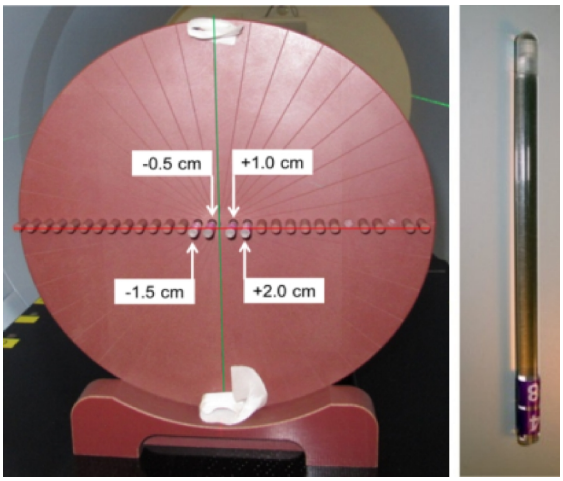


Fig. 1, left image: TLD and ionisation chamber measurement positions in the cheese phantom. Right: TLD stick containing 5 TLD discs.

The doses in the calibration plan are in the range of 2.00 Gy. For each institution, four TLD sticks (20 TLDs) were made available. Ten reference TLDs of each used TLD set (3 sets) were irradiated with a known dose by PTW Freiburg, Germany. The evaluation was performed with a Harshaw 5500 reader (Harshaw-Bicron, Solon, OH, USA). Additionally to the TLD calibration established for measurements in water, a cheese phantom specific factor was applied. It was defined in the 2014 Tomotherapy intercomparison and amounts to 1.0083.
A dose point evaluation is specified as a good result when the stated calculated (D_s) and the measured (D_m) doses coincide within 3%. It is satisfactory when the coincidence is better than 5%.

2. Results

All five Tomotherapy sites in Switzerland participated in the intercomparison. All dose point evaluations except two single TLD measurements led to a good result. All results are at minimum satisfactory. Figure 2 shows the D_m/D_s values for the TLD as well as the ionisation chamber measurements. The corresponding mean values are 1.001 ± 0.017 and 1.001 ± 0.010.

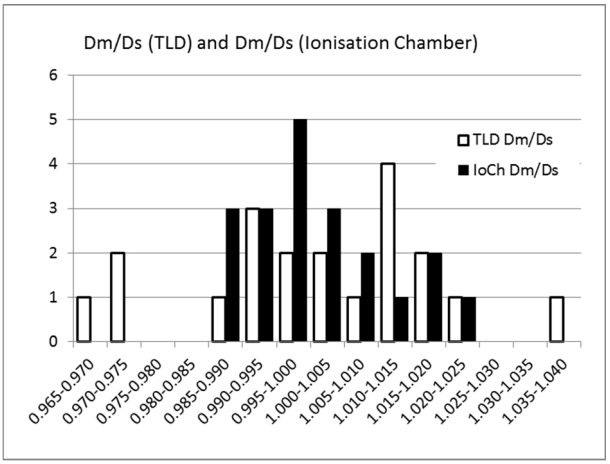


Fig. 2: D_m/D_s ratios for the TLD (n=20) and ionisation chamber measurements (n=20).

3. Discussion and Conclusion

The TLD and ionisation chamber measurements show two remarkable properties: The dosimetry for these measurement techniques are in very good mutual agreement and coincide very well with the stated doses.

This dosimetry intercomparison has proven the high dosimetry level in all Swiss Tomotherapy sites. All checked measurements show good or even excellent results.

Thanks

We thank all the participants for their participation in this intercomparison. A special thank goes to Dr. C. Pychlau, PTW Freiburg,

and his co-workers for the irradiation of the reference TLDs. Thank you also to Dr. G. Henke for his invaluable background job.

Konrad Buchauer, Simon Heinze, and Hans Schiefer

Klinik für Radio-Onkologie, Kantonsspital St.Gallen

SSRMP Research Grant 2017

In order to support and promote the scientific activities of our members in Switzerland active in all fields of Medical Physics, a research grant is provided by SSRMP. As in the last years, a financial grant of maximum **7'000 CHF** is offered for research projects fulfilling proper eligibility criteria.

The projects should:

- be promoted by at least one regular member of SSRMP
- be conducted entirely in Switzerland in one of the private or public institutes active in the field
- preference will be given to projects involving more than one institute aiming to a trans-linguistic and trans-cultural cooperative model
- be strictly linked to a field of interest of SSRMP
- be completed within the time span of one year from grant assignment

The group that will be awarded with the grant will have to provide the SSRMP Science Committee with a detailed report (inclusive of costs justification) at the end of the one-year period and will guarantee the publication of a scientific report in the SSRMP Bulletin. The scientific report should be, pending scientific committee's review and approval, submitted for oral contribution to the annual SSRMP meeting.

Deadline for submission of proposals is June 30th 2017.

Proposals should not exceed four A4 pages and should contain:

- project title, duration and financial request
- principal investigator's and co-investigator's names and responsibilities in the project
- short description of the scientific background
- short but detailed description of the project
- short description about current state of the art in the field

Proposals should be submitted (preferably via email) to the chair of the SSRMP Science Committee:
Raphaël Moeckli, Institut de Radiophysique, Rue du Grand Pré 1, 1007 Lausanne,
raphael.moeckli @chuv.ch

Varian Award 2016

SGSMP
SSRPM
SSRFM

SWISS SOCIETY FOR RADIATION
BIOLOGY AND MEDICAL PHYSICS (SSRMP)

AWARDS

THIAGO LIMA

WITH THE

VARIAN RECOGNITION AWARD 2016

FOR THE WORK

MONTE CARLO CALCULATION SUPPORTING PATIENT PLAN VERIFICATION IN PROTON THERAPY

THIS AWARD AIMS TO EXPRESS THE APPRECIATION OF A THOROUGHLY PERFORMED WORK BY WHICH AN IMPORTANT TOPIC IN RADIATION THERAPY IS COVERED AND WHICH IS THE BASIS FOR FUTURE STUDIES. IN HIS WORK, THIAGO LIMA ANALYZED AN ALTERNATIVE APPROACH OF CURRENTLY STANDARD WAYS OF PERFORMING PATIENT'S TREATMENT PLAN VERIFICATION. A COMPARISON BETWEEN IONIZATION CHAMBER MEASUREMENTS TO MONTE CARLO BASED DOSE CALCULATIONS WAS PERFORMED AND IT WAS SHOWN THAT IMPROVEMENTS OF THE DETECTOR GEOMETRY DESCRIPTION IN THE MONTE CARLO SIMULATIONS SUBSTANTIALLY INCREASED THE ACCURACY OF THE RESULTS. IN GENERAL, WITH THIS AWARD, THE PRIZE COMMITTEE RECOGNIZES ITS RELEVANCE IN THE FIELD OF RADIATION THERAPY AND PARTICULARLY IN PROTON THERAPY.

SURSEE, 25. AUGUST 2016

CHAIR OF THE VARIAN PRIZE COMMITTEE

RAPHAËL MOECKLI

PRESIDENT OF SSRMP

PETER MANSER

At the general assembly on August 25, 2016 in Sursee, one paper was awarded with the Varian Recognition Award of Radiation Oncology of SSRMP. We congratulate Thiago Lima and thank him for the important work. In addition, we thank Varian Medical Systems for their support.

Raphaël Moeckli, IRA and CHUV - Lausanne
President of the Varian Prize Committee

Varian Award for Radiation Oncology of SSRMP

Deadline for submission: March 31st 2017

Award rules:

1. SSRMP can award during the annual general assembly up to three Varian prizes. The maximum amount for a single Varian prize is SFr. 3'000.-. Varian Medical System Inc. donate to SSRMP each year SFr. 3'000.- for the Varian prize.
2. The prizes are given to single persons or to groups, which have made an excellent work in radiobiology or in medical physics. Members of SSRMP or groups with at least one member of SSRMP are legitimate to attend with a manuscript or with a published or unpublished paper of special importance, special originality or special quality. The size of the work should not exceed the normal size of a paper. A thesis normally exceeds this size. The person, who enters a paper written by more than one author, should have contributed the major part to this paper. The consent of the co-authors must be documented.
3. The winner gets the prize amount, as well as a diploma with an appreciation.
4. The invitation for the Varian prize is published in the bulletin of SSRMP. Direct applications or recommendations of other persons can be sent to the President of SSRMP. The documents should be entered in four specimens not later than six month before the annual meeting.
5. A prize committee judges the entered works. It consists at least of three members of SSRMP and is elected or reelected for 2 years by the SSRMP board. At least one member of the prize committee should be member of the SSRMP board.
6. The prize committee constitutes itself. The decision of award together with the appreciation should be sent to the board for approval.
7. Varian Medical Systems Inc. is indebted to announce in written form each change of the prize amount or a termination of the contract to the president of SSRMP at least one year in advance.
8. This regulation was accepted by Varian Medical Systems Inc. (Switzerland) September 27th, 2006 and renewed by the annual assembly of SSRMP September 27th, 2007. It can be changed only with the approval of Varian Medical Systems by a decision of the annual assembly of SSRMP.

Note that there will be an award ceremony during the general assembly in 2017 and a publication of the Varian prize recipients is then taking place in the SSRMP bulletin and on the SSRMP website.

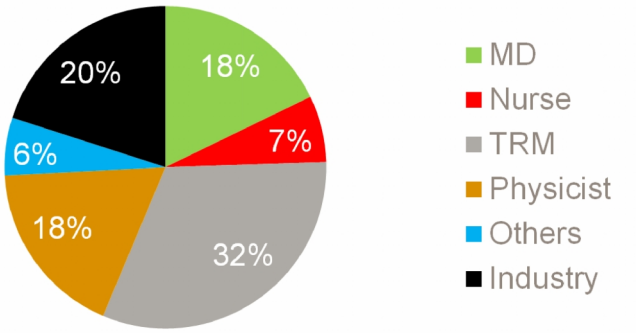
Raphaël Moeckli, IRA and CHUV - Lausanne
President of the Varian Prize Committee

Report on SASRO-SSRMP Joint Meeting 2016

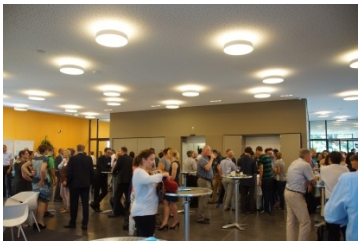
The 25th - 27th of August 2016 at the CAMPUS Sursee, was an opportunity to celebrate the 50th Annual Meeting of SSRMP and the 20th Annual Meeting of SASRO!

It was a great honor for me and the Hirslanden group to organize this event. We hope that everyone enjoyed the opportunity for scientific and social interactions with colleagues. There was good participation from all the radiation oncology professional groups.

Profession	Participation ~
MD	80
Nurse	30
Therapist	140
Physicist	80
Others	26
Industry	90



The annual meeting was also a great opportunity to talk to industry partners. We will all remember interesting discussions with industry partners in the tropical heat of the industry exhibition space as warm/friendly and also warm/hot!



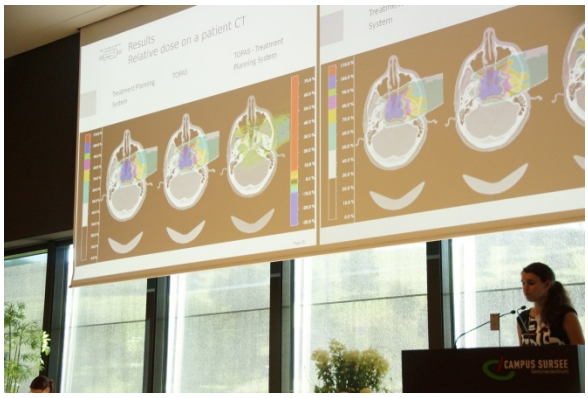
Despite some disappointment that the poster room was not well adapted to authors' expectations; we got a lot positive feedback from participants about the organization and the

scientific level of the meeting. Thank you to all of you who made a scientific contribution. Special thanks to Dr. Wilko Verbakel, medical physicist, from VUMC, Amsterdam, for accepting our invitation and sharing his experience with us.

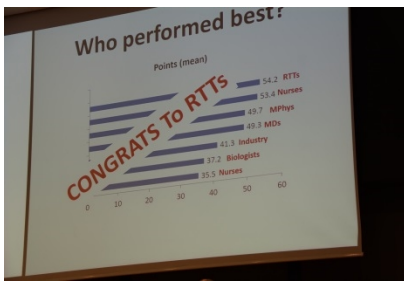
Congratulations to the award winners:
Oral presentation:

S. Tandini-Lang for Martha Nesteruk, Department of Radiation Oncology, Zürich, "Radiomics of CT perfusion maps"

Poster:
Werner Volken, Division of Medical Radiation Physics, Inselspital Bern, "Optimization for dynamic trajectory radiotherapy: Feasibility Study"



The games and gifts that were offered during the meeting were highly appreciated by all participants – and especially the winners!



The social event was a great success – the dinner was proposed in gastronomic fashion, with a live jazz music concert, at Water Castle Wyher.

I would like to thank my colleague and co-organizer **Dr. Guenther Gruber,** Congress President for the SASRO side, his wife, and his sons for their precious help, which was key to the successful congress organization. I would like also to thank Peter Manser, SSRMP President for his help and support.

I wish the organizer of next year's SSRMP meeting all the best!

Rachid Boucenna
Congress President SSRMP 2016

“Double trouble” in Athens

When one decides to combine a trip home with academia, what better way than to visit your country for a conference? And although summer is said to be the best time to visit Greek islands, September is definitely a much more appropriate time to visit the capital.

The eve of this year’s fall finds us in Athens, starting off with the first European Congress on Medical Physics [ECMP2016], organized by EFOMP, with the helping hand of the Hellenic Association of Medical Physicists (HAMP). The event was held at the Eugenides Foundation, right across Athens’ new pride and joy, the Stavros Niarchos Foundation Cultural Center. Aside the touristic and cultural sites, 3 conference halls attracted the interest of about 700 professionals from all around Europe. A wide range of talks, from Radiation Oncology, to Therapy and Imaging, filled up a very rich 4 day program, with our eyes turned to the Apennine Peninsula, as (according to the congress slogan) “ECMP welcomes Italy”.

Outside the conference halls, a computer station gave the opportunity to browse through over 150 e-posters. Alongside all the scientific talks came the professional ones, with HAMP organizing a side event on “Academic and Professional Mobility of young Medical Physicists”, for those of us trying to find our way through Europe or even across the Atlantic Ocean. Of course, Greek culture couldn’t be absent from this weekend, and a lovely opening ceremony, with music and Cretan dancers, a private screening in the Planetarium, as well as a beach party, gave visiting scientists a taste of Greece.

This 4 day congress, though, left this particular young Medical Physicist with an unsettling feeling. How much talk is too much talk? Are conferences always **just** about presenting your work? What

happened to discussion? We are experts on QA; therefore, why have we focused, lately, on quantity rather than quality, when it comes to conferences? Bombarded by a horde of oral presentations, I was left feeling quite puzzled on how far we've gone in general as an academic society. Could it be that one conference less or one with less oral presentations, would leave the attendees with a much clearer and stronger take home message?

After a week of vacation we returned to Athens for ESTRO's Course on "Physics for Modern Radiotherapy". And that was a week well spent! A variety of talks on almost all aspects of Modern Radiotherapy. From beam delivery to QA, from photons to protons, from uncertainties to margins, from debating on treatment planning techniques to discussing on adaptive radiotherapy and radiotherapy's future, what stroked me most was the level of the teachers. It is such a lovely surprise not to be able to distinguish the Physicist from the Oncologist. A true honor and inspiration for all the attendees, to be among those professionals.

It was without doubt an intriguing course, which started with an "entrance" exam, just to tense you up about how much you have yet to learn (if you are under training) or how much you may have forgotten (if you are a practicing professional). A series of lectures, accompanied by discussion sessions on treatment planning, where participants had to prepare and present their way of treating different anatomical sites, like breast, lung or a head and neck case. And in the evenings, the inevitable would happen; Athens by night.

After 5 days of lectures and a few glasses of tsipouro with colleagues from around the globe, we said good-bye to the Hellenic capital and landed back to our new found home, north of the Alps.

Nada Fachouri,
PSI

First ECMP, Athens, September 1-4, 2016
Jean-Yves Ray, Elina Samara
Hôpital du Valais

Background on the first European Congress of Medical Physics (ECMP)

The European Federation of Medical Physics (EFOMP) proposed to organize a large European scale meeting involving all areas relevant for medical physics. Although well-established, European wide events related to clinical applications in radiotherapy, nuclear medicine and radiology, with respectively ESTRO, EANM and ECR congresses, focus each mainly on one component of medical physics. Therefore, they especially attract physicists involved in their own clinical field. EFOMP did not design ECMP to compete with these attractive meetings. Indeed, medical physics, considered as a medical specialty, must foster physics into their related clinical environment. It is the upmost importance that medical physicists meet with physicians. However, EFOMP believes that there is a need to additionally gather all those medical physicists together. ECMP should become their generalist platform for sharing scientific experiences in all fields of medical physics.

For promoting ECMP, EFOMP stated to capitalize on its strengths which are its strong involvement in all areas of medical physics and in education. A large part of the meeting program should be given to education for medical physicists and medical physicist experts. In parallel, promoting the participation of young scientists should be a clear goal. Each components of medical physics as radiotherapy, nuclear medicine and radiology should receive an equivalent attention. Additionally, ECMP should also address other imaging methodologies such as the MRI and ultrasound and all domains of medical physics (optics, etc.).

ECMP will be a biennial conference jointly organized by EFOMP representative and a local organizing committees. The next meeting will be held from August 23rd to 25th 2018 in Copenhagen, Denmark.

Meeting report

The first ECMP was jointly organized by the local organizing committee (Greece) and the congress program committee supported by EFOMP. The program of the congress was organized in three parallel sessions according to the different specializations (radiation therapy, nuclear medicine, radiology), so one could easily choose the sessions of his/her interests. It was clear that although the intention of the organizing committees was to keep a balance between all disciplines, the balance tilted towards medical imaging with excellent invited speakers. What we liked and hope to see again in future meetings was that some scientific sessions were divided into two parts with a 20-minute invited talk from an expert either from Europe or overseas, followed by short presentations from different groups. The quality of the short scientific talks varied a lot. A lot of joint sessions were also included in the program: EFOMP-ESR, -IAEA, -EANM, -ESTRO, etc. which clearly gave the message that the EFOMP collaborated with all scientific organizations. We really appreciated the refresher courses and special sessions.

The following topics were the highlights of the sessions that we attended:

Computed tomography (CT)

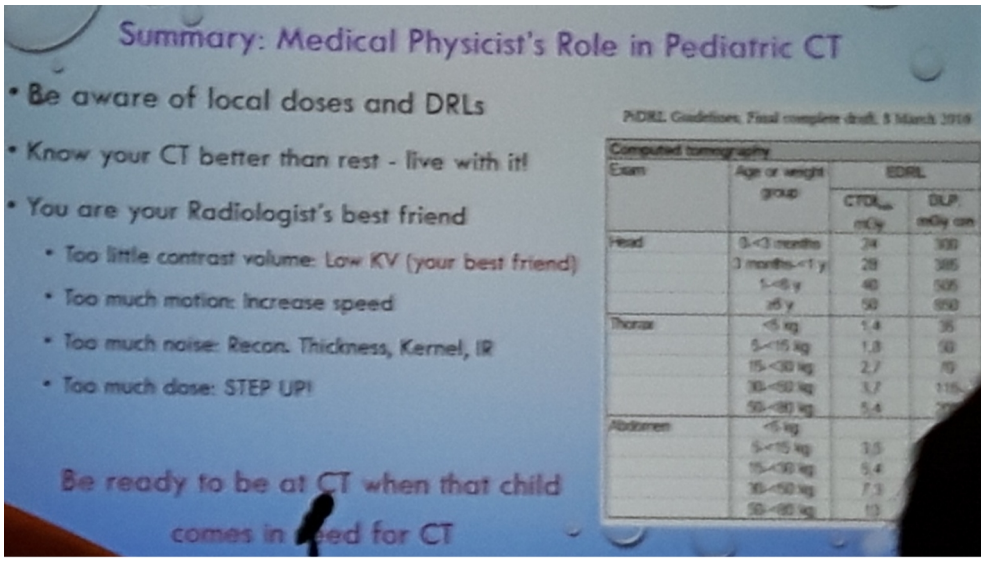
CT was one of the most important, if not the most important, elements in the congress. Invited lectures included:

- CT dose optimization
- Dose optimization in cardiac CT
- Dual energy CT: physics and applications
- Radiation dose from dual energy CT applications
- X-ray CT dedicated to the breast

- Patient-specific dosimetry in CT
- Quality control in CT
- Radiation incidents in CT

It is difficult to share the details of all these presentations in this short review. A key message, though, was that dual energy CT allows lower doses than single energy CT by usually reducing the need of an additional scan with contrast medium.

A motivating point was that the expert radiologist from the USA that presented the pediatric CT optimization finished his talk with the message "You are your Radiologist's best friend. You may find here below the corresponding slide (apologies for the quality – it was not intended to be published). Now, we should just look for our best friends in the hospitals!



Dose management systems

Many studies were based on the dose management systems. Our colleagues showed that they are very powerful tools not only for DRL management but also for protocol management (nomenclature, alerting, detection of different practice, etc.). Classical presentations about DRLs were naturally included, but an important message about the DRLs came from the ESR: DRLs should be defined according clinical indications and not image acquisitions protocols.

Comment: Clinical indications in combination with the dose management tools may help us better collaborate with radiologists and technologists in order to optimize doses. For many years, medical physicists are "accused" to be far from medical practice, not to understand clinics, to be too scientific, to be too physicists. This is an excellent example for us to make a step from "medical *physics*" to "*medical* physics".

Educational and professional issues

Educational and professional issues were discussed in several sessions. Professional issues of medical physicists are a burning topic in Switzerland as well as in whole Europe with the harmonization of the legislation with the new Euratom. The recognition of medical physics expert in the European level in relation with the EUTEMPE-RX project was also presented. The IOMP and IAEA gave their point of view about how to raise awareness of medical physics.

MRI quality assurance and safety

A presentation on basic quality assurance (QA) in MRI was followed by two presentations on QA for quantitative MRI and MRI for radiation therapy.

What is important for medical physicists is that basic acceptance tests are not enough for quantitative MRI. Sensitivity, accuracy and specificity need to be tested and it is a great challenge for medical physicists to design sequences that will satisfy all parameters. Moreover, both healthy volunteers and phantoms are necessary for QA.

MRI in radiation therapy is getting really important for treatment planning, evaluation of treatment response as well as treatment localization and delivery. Challenges for the MRI simulation in treatment position include long image acquisition, standard bore, special coils and immobilization devices. There are already commercial solutions for flat couch top, MRI compatible fixation, etc. Of course, distortion correction maps and artifacts should be considered with greater care and again, the medical physicists have a significant role to play.

http://www.mrisafety.com → Extensive information about MRI safety can be found in this site (compatibility of different implants, devices and materials with MRI, pregnant patients, bioeffects of magnetic fields, etc.). An important comment from the speaker was that there is no safety information for fields greater than 8T and there are already machines that can generate stronger fields.

Unfortunately, only few medical physicists work on MRI applications in Switzerland and no medical physicists are currently required by the Swiss law for non-ionizing applications in medicine.

High-intensity focused ultrasound (US)

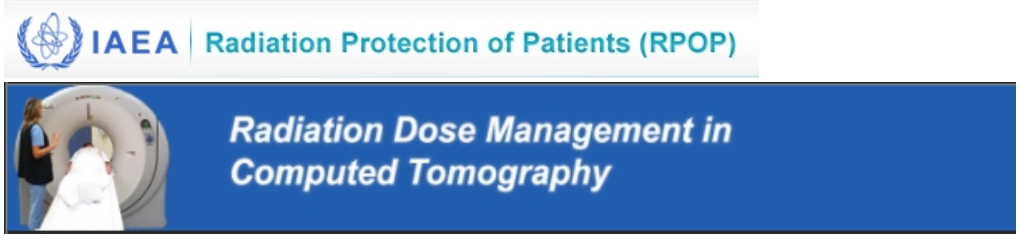
The medal award was given to G. Borasi. We were truly impressed by his enthusiasm and passion for his work on US. Old methods find new attractive applications, such as thalamus tumor therapy, opening of blood brain barrier for introducing specific drugs and hyperthermia for glioblastoma radiation therapy.

What was not included in the 1st ECMP

IGRT: We expected to see dedicated sessions on IGRT (QA, dose optimization, IGRT protocols, etc.) as the subject itself brings medical physicists from imaging and radiation therapy together, but unfortunately it was not the case.

Overall, it was a very interesting congress for medical physicists. Colleagues with different background in the field (radiation therapy, nuclear medicine, medical imaging with ionizing and non-ionizing radiation and other application of physics in medicine) had the chance to meet and get informed about current matters in medical physics. A Focus Issue that will include up to 40 papers by authors presenting in ECMP 2016 will be published in March 2017 in Physica Medica. We hope that the level of the next congress will be as high as the first one and more colleagues from Europe and Switzerland will attend it.

IAEA E-LEARNING



For more information:

https://rpop.iaea.org/RPOP/RPoP/Content/AdditionalResources/Training/E-learning/

IAEA E-LEARNING IN SAFETY AND QUALITY IN RADIOTHERAPY

http://elearning.iaea.org/m2/course/view.php?id=392

What do we offer?

The International Atomic Energy Agency has prepared e-learning programme offering participants to improve their understanding of safety in radiotherapy, learn techniques to reduce and avoid radiotherapy incidents and understand the value and use of incident learning systems. The e-learning consists of 12 modules:

Module 1: Introduction
Module 2: Major Incidents in Radiotherapy
Module 3: Learning From Incidents
Module 4: Process Maps, Severity Metrics, Basic Causes & Safety Barriers
Module 5: Reporting Incidents Using Safron
Module 6: Root Cause Analysis 1. Human Factors & Basic Causes
Module 7: Root Cause Analysis 2. Safety Barriers & Preventive Actions
Module 8: Failure Modes and Effects Analysis
Module 9: Fault Tree Analysis
Module 10: Safety Culture
Module 11: Useful Resources
Module 12: And Now What? Enhancing Quality and Safety in Your Clinic

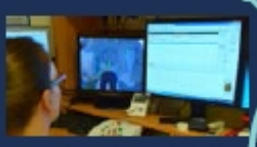
The e-learning is available on the IAEA internet platform accessible to everyone. After the completion of the course, the participants can receive a certificate of completion.

How do I access the e-learning programme?

Create an account with Cyber Learning Platform for Network Education and Training (CLP4NET) (http://elearning.iaea.org/m2/) and access Radiation Protection of Patients Category (http://elearning.iaea.org/m2/course/view.php?id=392).

Would you like to receive more information?

For more information, please write to: SAFRON.Contact-Point@iaea.org

CALENDAR 2017

26th-28th January Prague, CZ	ESMPE, European School for Medical Physics Experts Imaging in Radiotherapy *http://www.csfm.cz/winter2017.html*
1st-5th March Vienna, AT	European Congress of Radiology (ECR) 2017 *http://www.myesr.org/*
6th-17th March Pichl, AT	Winterschule Pichl für Medizinische Physik 2017 *http://www.winterschule-pichl.de/*
5th-9th May Vienna, AT	ESTRO 36 Vienna *http://www.estro.org/congresses-meetings/items/estro-36*
8th-10th June **St. Gallen**	**21st SASRO Annual Meeting** *http://www.sasro.ch*
10th-14th June Portland, USA	AAPM Summer School – Clinical Brachytherapy Physics http://www.aapm.org/meetings/2017SS/
14th-16th June Lyon, FR	56èmes Journées Scientifiques de la SFPM *http://sfpm-js2017.sciencesconf.org*
30th Jul-3rd Aug Denver, USA	AAPM 59th Annual Meeting *http://www.aapm.org/meetings/2017AM/*

And please, if you participate in any conference or meeting, think of writing a few lines or sending a picture for the Bulletin.

THANK YOU!

KSA-KSB Baden

Auf dem Gelände hinter dem Hauptgebäude des Kantonsspitals Baden wurde in den Jahren 2014 bis 2016 ein mehrstöckiges Gebäude, genannt Kubus, mit einer ebenerdigen Radio-Onkologie Abteilung und einem Strahlenschutzbunker im benachbarten Hügel gebaut.

Das modern konzipierte Gebäude beherbert ausschliesslich Behandlungsangebote für ambulante Patienten. Grossfächige Fenster und helle Farben lassen das Minergie zertifizierte Gebäude auch im Inneren strahlen.

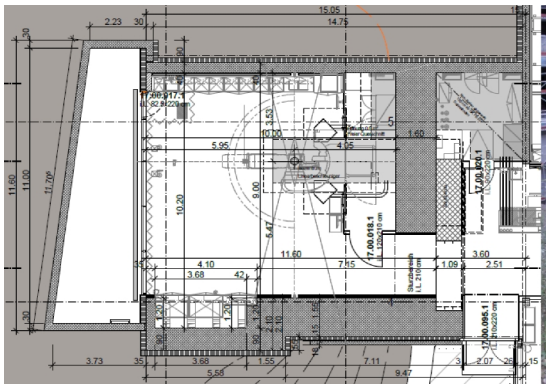


Abbildung 1: Grundriss Bauplan Strahlenschutzbunker [2]. Abbildung 2: Rohbau Strahlenschutzbunker ohne Lichthof. Abbildung 3: Kubus mit Radio-Onkologie (Teil unterste Etage) und mit Strahlenschutzbunker (ganz links).

Analog zum Bunkeraufbau am KSA wird der grosszügige labyrintlose Bestrahlungsraum von einem Lichthof abgeschlossen. Die aufwendige Strahlenschutz-Dosimetrie wurde durch eine Studie zur Neutronendosimetrie ausserhalb des Gebäudes durch die Firma VARIAN und das PSI unterstützt.

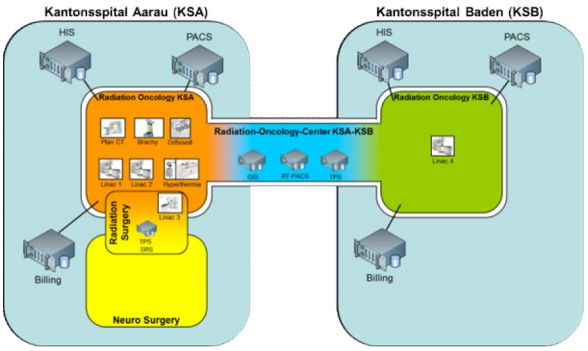
Im März 2016 wurde mit Hilfe eines Pneukrans ein TrueBeam 1 Linearbeschleuniger in den Strahlenschutzbunker eingebracht. Bei der Kommissionierung des Linearbeschleunigers durch das Physikteam des Kantonspitals Aarau stand die Angleichung der Strahlparameter an die installierten TrueBeams des KSA im Vordergrund. Nach einem erfolgreichen Tag der offenen Tür durften wir am 04. Juli mit der ersten Bestrahlung starten.

Die Betreuung des Beschleunigers wird aus dem Team des Kantonsspitals Aarau gewährleistet. Das Team vor Ort besteht aus einem Medizinphysiker, einem Radioonkologen, drei MTRAs und zwei Sekretärinnen. Unterstützt wird das Team durch einen

Beschleunigertechniker und einen Medizin-Informatiker. Konsultation, Bildgebung, Bestrahlung sowie die Administration werden in Baden durchgeführt. Die Therapieplanung wird in Aarau mit dem Eclipse 1 Planungssystem durch das Dosimetrieteam gemacht. Tägliche Videokonferenzen gewährleisten den fachlichen Austausch zwischen den beiden Standorten.

Abbildung 4: Blick vom TrueBeam in den Bestrahlungsraum

Das Radio-Onkologie-Zentrum KSA-KSB betreibt seine IT-Infrastruktur für die Radio-Onkologie, in einem SaaS Konzept 1, extern. Zentral daran angebunden sind insgesamt vier Linearbeschleuniger einschliesslich dem Linearbeschleuniger des Kantonsspitals Baden. Sämtliche benötigten Daten und Applikationen für die Radiotherapie-Behandlungen sind auf zentralisierten Servern gespeichert und über eine Private Cloud an beiden Standorten in Echtzeit zugreifbar. Alle virtuellen Systeme laufen redundant im Data Center A und werden mittels Backup-to-Disk ins



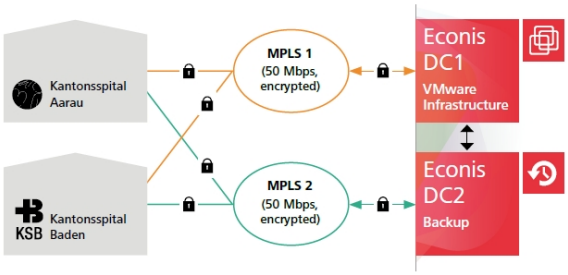


Abbildung 5: zentrale IT für beide Standorte. Abbildung 6: Anbindung an das Rechenzentrum

Data Center B gesichert. Die Nutzung ist Plattformunabhängig und erfordert einzig einen Internet-fähigen Computer und eine Internetverbindung. Der sichere Zugang erfolgt über einen Webbrowser. Dank des Cloud-Modells kann das Zentrum Synergien nutzen sowie Anschaffungen und operationelle Kosten einsparen.

[1]Varian Medical Systems
[2]Steiger Concept

Peter Egli

English translation by editor:

On the site behind the main building of the cantonal hospital Baden, a multi-storied building, called Kubus, was built between 2014 and 2016, with a flat radio-oncology department and a radiation protection bunker in the neighboring hill.

The modern design building is only used for outpatient treatments. The Minergie-certified building also has a large window and bright colors.

Analogous to the bunker construction at the KSA, the generous labyrinthine irradiation bunker is closed by a halo. The complex radiation protection plan was supported by a study on neutron dosimetry outside the building by VARIAN and PSI.

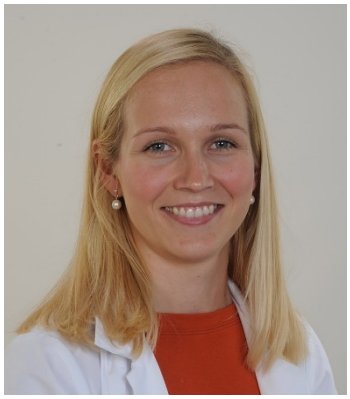
In March 2016, a TrueBeam[1] linear accelerator was introduced into the radiation protection bunker with the help of a pneumatic crane. During the commissioning of the linear accelerator by the physics team of the Kantonspital Aarau the alignment of the beam parameters with the installed TrueBeams of the KSA was in the foreground. After a successful opening day we were allowed to start the first irradiation on July 4th.

The support of the accelerator is ensured by the team of the cantonal hospital Aarau. The team consists of a medical physician, a radiologist, three MTRAs and two secretaries. The team is supported by an accelerator technician and a medical computer scientist. Consultation, imaging, irradiation and administration are carried out in Baden. The treatment planning is done in Aarau with the Eclipse[1] planning system by the dosimetry team. Daily video conferencing ensures the professional exchange between the two locations.

The radio-oncology center KSA-KSB operates its IT infrastructure for radio-oncology, in a SaaS concept[1], externally. A total of four linear accelerators, including the linear accelerator of the Kantonsspital Baden, are centrally connected. All required data and applications for radiotherapy treatments are stored on centralized servers and accessed via a private cloud at both sites in real-time. All virtual systems run redundantly in DataCenter A and are backed up to DataCenter B using a backup-to-disk. The usage is platform-independent and requires only one Internet-enabled computer and an internet connection. Secure access is via a web browser. Thanks to the cloud model, the Center is able to leverage synergies, as well as reduce procurement.

WELCOME!

Izabela Pytko



I come from Krakow, Poland where I graduated with a Master's degree in experimental nuclear physics and after finishing university, I continued working in particle physics research. For family reasons, and my passion for the mountains, I moved to Zurich almost 4 years ago. Here I discovered medical radiation physics and, for personal reasons, I felt very motivated to work particularly in radiation oncology. I was very lucky to meet, quite quickly, wonderful people from the medical physics world in Switzerland, who helped me take my first steps in the field. In May 2014, I did a one-month internship in KantonsSpital Aarau, where I got even more certain that this is what I would like to do with my life. I was very happy when I got the training position at the University Hospital Zurich in June 2014 and started my education there. In September this year I graduated from MAS in medical physics at the ETH, and in November I passed the SSRMP board certification exam in medical radiation physics. My training period finishes in May 2017 when I will be fully certified.
In my personal life, I am a wife, rock climber, paraglider pilot, ski tourer, ice climber and I enjoy every kind of sport which is related to the mountains. I find myself an extremely lucky person to be able to fulfill myself both in my private and professional life, and in both aspects, do what I love.

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Giulia Lucconi

Giulia Lucconi graduated from the University of Bologna, Italy.
During her residency program, she worked in Imaging, Radiology, Computed Tomography, MRI, Nuclear Medicine and Radiation Oncology. She also developed her own research projects, including but not limited to:

- current modulation systems for dose reduction in CT,
- Functional MRI and fibertracking,
- production of non-standard radionuclides and
- cyclotron production of ^{99m}Tc.

She spent six months at the Radiation Oncology Department of Massachusetts General Hospital (Boston, MA, USA) for a project on an in-vivo proton range verification method. In Italy she has the title of "Qualified Expert in Radiation Protection of 1st degree".
She is currently working as a Medical Physicist in a joint position at the Proton Therapy Center of the Paul Scherrer Institute (Villigen, AG) and the clinic for Radiation Therapy of the UniversitätsSpital Zürich.

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WELCOME!

Martin Müller

A while ago, I graduated with a PhD in Astrophysics from Stanford University and have since been working in Physics education. As of May 2016, I am now with the Clinic for Radio-Oncology at the UniversitätsSpital Zürich as a Medical Physicist in Training, step by step getting involved in all aspects of the field. With a background in database reporting and software development, I am also collaborating with my colleagues on a number of projects involving the planning and treatment work flow at our clinic, data quality assurance in our patient database and the statistical evaluation of clinical data. I am grateful to the clinic for the opportunity to enter the field and look forward to working toward SSRMP certification over the next years.

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Jan Unkelbach

In October 2016 I joined the University Zürich as an Assistant Professor for Medical Physics. I will contribute to medical physics education and strengthen the research activities in the Radiation Oncology department at the University Hospital.

After I graduated from the Technical University Berlin with a master degree in physics, I pursued a PhD at the German Cancer Research Center in Heidelberg. After graduating in 2006, I moved to Massachusetts General Hospital in Boston, where I worked with Thomas Bortfeld for 2 years. After a short stay at the research institute IDSIA for artificial intelligence in Lugano, I returned to Massachusetts General Hospital in 2010 to become an Assistant Professor of Radiation Oncology.

My main research interest is centered around treatment planning in radiation oncology. For many years, I have been working on mathematical optimization algorithms for treatment planning for intensity-modulated radiotherapy with photons and protons. Recent research interests are focused on imaging for target delineation, as well as optimizing fractionation schemes and radiotherapy delivery over time.

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WELCOME!

Chems Fatnassi

I recently obtained my SSRMP certification in medical radiation physics. I am currently working as a medical physicist in Klink HIRSLANDEN Lausanne, which I joined in 2014.
Prior to this, I obtained a Bachelor's degree in Applied Physics from the University of Angers (France) followed by a Master's degree in Applied Physics and Subatomic Research at the University of Nantes (France).
In parallel to my medical physics pathway, I am currently finalizing my PhD project with the PET Instrumentation and Neuroimaging Laboratory at the University of Geneva, in the field of Quantitative MRI physics. The goal of the project is to understand the physics behind a couple of artefactual signal behaviors in the presence of susceptibility induced macroscopic field inhomogeneities.

I had the opportunity to do an internship in Lausanne during my masters degree, in the nuclear medicine department of the CHUV and the Institut de radiophysique (IRA), which sparked my interest to explore the medical physics field. Since April 2014, it has been a privilege for me to do an SSRMP internship under the supervision of Dr. Rachid Boucenna within the HIRSLANDEN radiotherapy group. This internship has allowed me to acquire basic medical physics knowledge, and gain experience in clinical physicist duties and practices. My particular interest is in optimizing and developing new treatment strategies.

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Philippe Logaritsch

I grew up in Lachen SZ and studied mathematics and physics at the University of Zurich. After obtaining my master's degree I moved to Leipzig where I did a PhD at the Max-Planck Institute for Mathematics in the Sciences. During this time I started to discover my interests in applications to medical physics and I decided to aim for further education and practical experience in the very active and interdisciplinary area of radiation therapy. Since September of this year I'm working as a trainee in the medical physics group of the institute of radio-oncology at the Luzerner Kantonsspital. I am currently also enrolled in the MAS ETH in Medical Physics.

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