BULLETIN

April 2019

SGSMP
SSRPM
SSRFM

Schweizerische Gesellschaft für Strahlenbiologie und Medizinische Physik
Société Suisse de Radiobiologie et de Physique Médicale
Società Svizzera di Radiobiologia e di Fisica Medica
Swiss Society of Radiobiology and Medical Physics

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Editorial

Letter from the Editors

Dear SSRMP members,

As highlight for this Bulletin issue, you can find the newly formed compositions of the SSRMP board and committees. Participating and contributing to the activities of our society, keeping up to date our recommendations, guidelines and reports, requires time, commitment, and a lot of interactions with other members and colleagues. Therefore, thank you all for your involvement and motivation! And for the newbies, welcome on board!

Following the "file rouge" of the editorial of last year's summer Issue, Bulletin 92 - where I "throw on the table" the idea that challenging ourselves with something a bit out of the (water phantom) box might renew the spirit and motivation for attending to our professions (maybe because we become more aware of ourselves?) - the medical physics group from La Chaux de Fonds offers us a very interesting and inspiring insight on a creative way of blending our personal passions with our work. Ever thought of producing something of your own, i.e. honey on the roof of your hospital??
Ok, I won't spoil more than that. To be(e) or not to be(e). Discover it for yourself!

Coming back to the professional (but never boring) level, keep an eye on the upcoming SSRMP conference and meeting announcements in the SSRMP News section. The Swiss Congress of Radiology (SCR), where SSRMP cooperation in organizing some of the sessions is expected this year for the very first time, as well as the AMP and SASRO meetings are coming up soon.

Thank you to all the people contributing to the Issues of Interest section, sending detailed reports from the SSRMP annual meeting held in Lausanne in November last year, the European Congress of Radiology and the SSRMP Clinical Educational Day. Finally, let's appreciate the contributions from those who have accepted to reveal a bit of themselves and their stories, through the Personalia or the PhD Platform.

Francesca Belosi,
On behalf of the Editorial Team.

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Cover Image: fluid dynamics, honey spirals - https://www.dreamstime.com/photos-images/honey-fluid.html?pg=2

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PRESIDENT'S LETTER

Dear colleagues,

Spring time is coming and the daylight is getting longer and longer, which means it's a perfect time to start new tasks, new projects or having a come together with colleagues for a barbeque. In addition, spring time also means a new Bulletin is ready for you providing a lot of interesting information dealing with medical physics and radiobiology. However, there is also more than that as you can find out in this issue demonstrating physics responsibilities for whole populations. Curious? I would **BEE**.

Since the general assembly in November 2018, two board meetings took place. The constitution of the board is done and the chairs of the permanent committees were elected by the board as well as were the members of the different committees. I would like to take this opportunity to thank all committee members for their great work. Many of them are on duty for several years already, but it is also worth mentioning that new members are joining the group providing new perspectives and also gaining experiences. In addition, the IOMP and EFOMP delegates of our society were voted. All the information is available on our website, where Jean-Yves Ray is doing a great job in not only keeping all information up-to-date, but also adding new information and features, so it's worth checking out our website regularly.

Spring season also means conference season starts and in 2019 a lot of interesting events take place for medical physicists on national and international levels. There will soon be ESTRO in Milan (April), which is close by and a good opportunity to show up and looking for news in the field, chatting with colleagues or exchanging experiences. Other highlights follow in June: first there will be the Swiss Congress of Radiology (SCR) in St. Gallen, which at least to my knowledge presents for the first time several joint sessions with SSRMP, demonstrating the good and more intensive collaborations with

PRESIDENT'S LETTER

related societies. I encourage all of you to join this conference and being part of this collaboration, which becomes more and more important in the future. Second there will be the combined conference of ICCR & MCMA 2019 in Montreal. In August the SASRO meeting is held in Lausanne and in September there is the IOMP supported International Conference on Medical Physics in Chile. Another special meeting takes place in September in Stuttgart, where our colleagues from DGMP celebrate their 50th birthday. Of course, there will be also our annual SSRMP meeting in November at PSI. Sairos Safai is chairing this event together with Tony Lomax. The preparation of the meeting already started and I hope you are with me in looking forward to an interesting event at PSI. At this place, I again would like to strongly encourage you to actively support the meeting by submitting an abstract and, of course, attend the meeting.

Finally, given the still not complete list of interesting events, it is clear that not all of us will attend all these conferences and meetings. Thus, it becomes important that those who attend are willing to share their insights and findings with all of us. One option is to make a contribution to the Bulletin. I am sure the editors are more than willing to receive your input in order to put together another interesting upcoming Bulletin. For now, this Bulletin is ready thanks to the great effort of the editors. Spring time can come and enjoy reading the Bulletin.

Michael K Fix,
SSRMP President

PROFESSIONAL AFFAIRS

SSRMP executive board and permanent committees compositions

The SSRMP general assembly 2018 was held at the university hospital of Lausanne on November 22.
The executive board was renewed:

- **Michael Fix** was elected as new President SSRMP
- **Regina Seile**r was elected as new chair of the committee for Educational Affairs (ad interim)
- **Jean-Yves Ray** was confirmed as chair of the committee for Professional Affairs
- **Raphael Moeckl**i was confirmed as chair of the committee for Scientific Affairs
- **Yvonne Käser** was confirmed as board member
- **Roman Menz** was confirmed as board member
- **Markus Notter** was confirmed as board member
- **Stefano Presilla** was confirmed as board member
- **Stefano Gianolini** was elected as new board member

With many thanks, **Peter Manser** (President) and **Frédéric Corminboeuf** (chair of the committee for Educational Affairs) stepped down after several years of strong commitment to SSRMP.

On February 27, the executive board decided its further appointed members:

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

The compositions of the permanent committees are as follow :

Educational affairs

Regina Seiler (chair)
Francesca Belosi, Frédéric Corminboeuf, Stephan Klöck, Götz Kohler, Regina Müller, Angelika Pfäfflin, Valéry Zilio.

Professional affairs

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

Scientific affairs

Raphaël Moeckli (chair)
Shelley Bulling, Maud Jaccard, Peter Manser, Marc Pachoud, Stefan Scheib, Stephanie Tanadini-Lang
Varian prize committee: Matthias Guckenberger, Thiago Lima, Roman Menz, Hans Neuenschwander, Pierre-Alain Tercier, Yitzhak. Zimmer.

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

On behalf of the SSRMP board,
Jean-Yves Ray

SCIENCE

SCR' 2019 Announcement

SCR'19
JUNE 13–15, 2019 I ST. GALLEN
SWISS CONGRESS OF RADIOLOGY
SCHWEIZERISCHER RADIOLOGIEKONGRESS
CONGRÈS SUISSE DE RADIOLOGIE

SCR is the largest radiological scientific & educational meeting in Switzerland. It is organised by the Swiss Society of Radiology (SGR-SSR), the Swiss Society of Nuclear Medicine (SGNM-SSMN) and the Swiss Association of Radiographers (SVMTRA-ASTRM).

This year, the SSRMP was invited to co-organise six sessions together with the SGR, the SVMTRA and the SGNM. This is a great opportunity for the medical physicists to increase their contribution and to strengthen the position of the profession within the field of medical imaging.

Venue

Olma Messen, Splügenstrasse 12
CH-9008 St. Gallen

Congress Presidents

SGR-SSR	Prof. Hatem Alkadhi, Zürich
SGNM-SSMN	Prof. Dr. Flavio Forrer, St. Gallen
SVMTRA-ASTRM	Mrs. Isabelle Gremion, Epalinges

Registration

Open! "Members fees" for SSRMP members
http://www.radiologiekongress.ch/congress-2019/registration/

SCIENCE

SASRO Annual Meeting Announcement

SASRO MEETING 2019

23rd Annual SASRO Meeting
29th to 31st August 2019 in Lausanne

Congress venue
SwissTech Convention Center
Route Louis-Favre 2,
1024 Ecublens

Congress President
Prof. Jean Bourhis, MD, PhD
Department of Radiation Oncology, CHUV

Registration
Registrations are open
https://www.sasro.ch/sasro-2019/registration

Next Applied Medical Physics (AMP) Meeting

It is my pleasure to announce the next AMP meeting. This meeting is a general platform for all interested persons in medical physics.
Traditionally, the AMP meeting is split up into two parts. In the first part, a dedicated topic is discussed while in the second part we concentrate on the current state of the different working groups of SSRMP.

Thus, please mark your calendar:

May 27th 2019, 13.15 - 17.00 h, Bern

Raphaël Moeckli,
Chair of SSRMP Science Committee and Chair of AMP

AMP

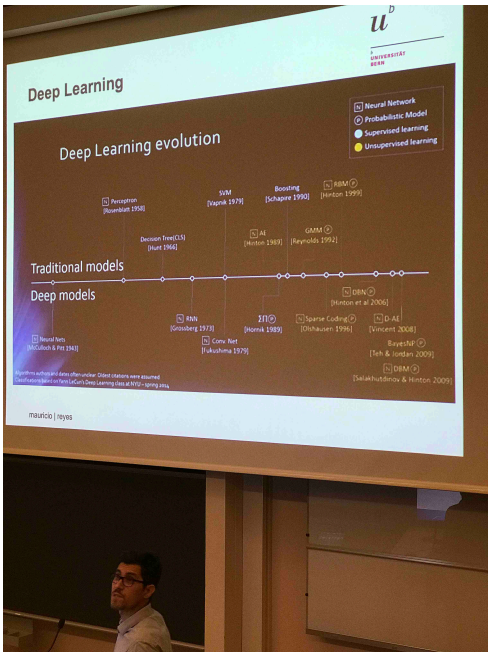
SSRMP Annual Meeting 2018

CHUV, Lausanne 22nd - 23rd of November 2018

On 22nd-23rd of November, the SSRMP annual meeting took place at CHUV (Lausanne), with 151 participants, 34 presenters, and two invited speakers. What has been most impressive during those days was the amount of young and new presenters and participants, as well as the lively and heated atmosphere. The audience was very ready to interact with questions, initiating discussions and sharing their own experience. I felt very lucky to be amongst people so dedicated and involved in their profession.

The presentations of the first morning were dominated by Monte Carlo (MC) and treatment planning topics. Some examples were given of scenarios where a MC tool could be inserted in the clinical workflow. One example of a MC tool is as a pre-treatment Patient Specific QA, replacing tedious and time-consuming measurements involving the setup of detectors and phantoms. Nevertheless, despite the well acknowledged higher accuracy of MC with respect to analytical dose calculation algorithms, it was also shown that MC engines are not always the most suitable solution (i.e. Nicci Lomax presented the results obtained at Aarau with MC calculations for intra-cranial radiosurgery) and their applications should be judiciously considered. After all, such high accuracy is not always indispensable and the "prize might not be worth the effort". Moreover, it was interesting to discover how much the base physics can be modelled differently with different versions of the same MC engine (i.e. upgrades). It turns out that MC physics is indeed relative physics. Relative to the MC version. Therefore, a thorough testing phase is recommendable when updating your MC engine.
What caught most of my attention throughout the afternoon session were the talks related to optimization of imaging dose. A "case report" presented by Bellinzona on how the intervention of the medical physicist - occurring at the request of the physician referring high mammographic doses - helped to significantly reduce the imaging dose (about 40%!) given by this kind of study, was quite enlightening. I am sure there are plenty of small clinics or departments in big hospitals where not much care is given to radio-protection and the consultation of an expert could be profitable and spare unnecessary risks and reactions to the patients. Furthermore, on this topic Thiago Lima gave two very interesting presentations, the 2nd of which was the announcement of the coming Swiss National CT Dose Registry. I am curious and looking forward to see which changes this tool can bring towards an optimization and "globalization" of imaging protocols.

The second day saw radiomics play protagonist of a few connected talks: how can radiomics be used to localize and characterize tumors; which factors (i.e. movement) can influence their output.
And, as previously mentioned, the contributions of two invited speakers occupied our minds for some time:
i) Prof. Mauricio Reyes, head of the Medical Image Analysis group at the Institute for Surgical Technology and Biomechanics in Bern, gave a "down to earth" (understandable for those, who like myself, have an innate aversion to machine learning) introduction to machine learning and deep machine learning, and some examples of what can



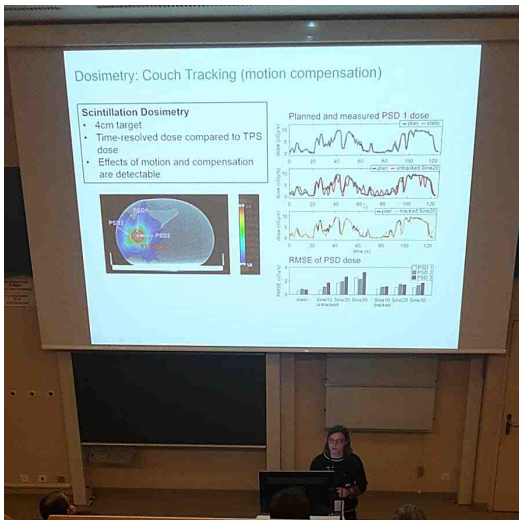
Prof. M. Reyes giving his presentation on (deep) Machine Learning

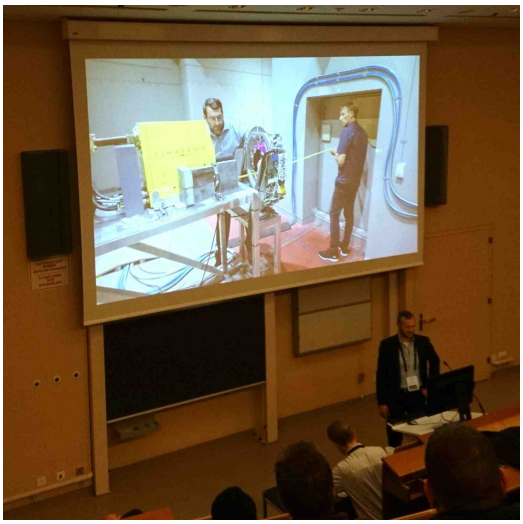
be practically realized with their applications. In particular, his group is currently working on automatic tumor volume delineation.

ii) Prof. Ben Eijmen, from Erasmus MC Cancer Institute (Rotterdam), introduced us to their automatic TPS developed in-house. Despite the interesting results and the appeal that an automated treatment planning software can generate (what medical physicist has never dreamt once to just push a button and go for a very long – one day in fact – coffee?), maybe also the consequences that such an application would bring on the human level, should be properly thought through: i.e. would this not lead to some controversies and discontent from the dosimetrists? The managing of the personnel and the potential need for re-thinking the role of the planners in a radiotherapy department should be considered.

On the same day, another pioneering idea was seen on stage (which some of you might recall from a previous Bulletin edition, in the PhD platform session): DYMBER, a combined photon and electron irradiation exploiting the best dosimetric characteristics of the two radiation qualities (i.e. steep distal dose gradient of the electrons and sharper penumbra of photons) for deep suited targets extending up to superficial layers. Thanks to the PhD work of Silvan Müller (Bern) DYMBER can be planned, can be delivered…it just needs to be QAed.

Finally, for whomever was still awake and endured the last presentations of the day, a group from PSI and a group from Universitätspital Zürich, presented (each completely blind to the other's initiative) "complementary" phantoms aiming to mimic respiratory motion for tumor tracking when it is located in regions such as the lungs and liver. One phantom, the LuCa phantom (PSI), had great lungs, but a poorer representation of the liver; the other phantom, ELPHA (Zürich), had a fantastic realistic liver, but poorer representation of the lungs.





Beside the oral presentations, as with every year, two additional events animated the Annual Meeting. The general assembly took place on Thursday afternoon, at the end of the sessions. Varian Awards were distributed, new board members elected, and the annual reports read. The social dinner followed after! It was a fine dinner in a "gemütlich" traditional swiss location: an old stable lost in the woods (it was a bit of an adventure to find the right path in the dusk and among trees!), smelling heavily of fondue and if this does not yet sound Swiss enough, the personnel was speaking only swiss-french! ;)

Francesca Belosi,
PSI

SSRMP Education Day

UniS, Bern 30th of January 2019

It was sunny in Bern that day. Crispy cold and bright. The air felt clean and fresh on the way to the University. On January 30th, nineteen trainees from all directions in Switzerland converged in room A-124 at UniS, to listen to a talk that would enlighten their knowledge on Urogenital Cancer. Starting at 9:15 and ongoing until midafternoon, Professor Frank Zimmermann generously covered these pathologies.

As part of the training for Medical Physicists, the Swiss Society of Radiobiology and Medical Physics, together with the collaboration of the Swiss Society for Radiation Oncology, make the effort of organizing a few days per year dedicated to continuous education of trainees, covering topics of clinical radio-oncology. With one-day talks, generally dedicated to a specific pathology and given by different Radiation Oncologists, Medical Physicists in training gain an overview of said pathologies, including introductions to the anatomy involved, epidemiology, diagnosis and treatments. Undoubtedly, this effort is highly appreciated by most trainees and their institutions, that also seek ways to allow their junior personnel to be absent on such days, even when this might mean some disruption on their usual clinical duties.

On this particular day, the most regular speaker on these educational courses, Professor Frank Zimmermann, offered his knowledge showing his very own and characteristic divulgative soul. His closeness presenting the topics and the wonderful anecdotes he usually splashes in his explanations, not only opened the room to a participative mood, it also allowed the information to flow easier into the trainees' brains. In the end, we have to accept that our most lasting memories are the ones attached to a remarkable anecdote.

Even though the level of the audience was uneven, both in knowledge and experience and in shyness, the general disposition in the classroom was mindful through the exposition of the anatomy, histology and epidemiology of Prostate Cancer. The slides about risk factors rose some questions, before the talk derived into detection, diagnosis and the exposition of the natural course of the disease.

After a small pause to let the fresh air come back into the room and to freshen up the minds of the trainees as well, Professor Zimmermann embarked himself into an extensive illustration of a more practical topic for a Medical Physicist: the therapeutic options of a Prostate Cancer patient. After some time, slowly and unavoidably, and despite the interest on the topic and the ability of the speaker to keep the information flowing lightly, it became clear that the physicists' brains and bodies needed some more air and, to a higher extent, sustenance. It was for this reason that, after the conclusions summing up an information-packed talk on Prostate Cancer, it was decided to face the rest of the pathologies in the afternoon, with renewed energy and sharper senses.

Lunch in the University restaurant was a time for exchange and networking. Surrounded by the aromas of the different menus and the echoes of dozens of conversations, here and there small groups of Medical Physicists chatted about their lives, their training and their institutions, creating small pools of trust between colleagues, until the break was over and the watches showed the time to find the way back to the classroom. Professor Zimmermann as waiting with his enthusiasm apparently intact, after the intense morning, ready to continue to deliver an afternoon of enlightment on Penile Carcinoma, Testicular Tumors and Bladder Carcinoma. All in all, a complete overview of the Urogenital Cancers that provided the trainees with information until the mid-afternoon, when the last summary, on Bladder Cancer, suggested to open an interdisciplinary discussion with the patient. A very fitting sentence to finish the exposition and send the trainees home. Back under the sun, trainees travelled again to their daily routines, with their minds, hopefully in most cases, a little bit smarter on Urogenital Cancers and the possibility of recovering that knowledge, saved for students in the SRO platform, for whenever those busy minds find that the memory of such extraordinary education starts to fade.

Maria de Prado,
PSI

West Asia Cancer Conference

Tehran, Iran 21st - 23rd of February 2019

In February a small delegation of the Luzerner Kantonsspital attended the West Asia Cancer Conference in Tehran, Iran - not a typical choice of conference for people working in Switzerland. It came to be through the relations of Yousef Najafi, a Swiss-Iranian physician working in Lucerne, who arranged for Gabriela Studer, Timothy Collen and I to be invited speakers. Since the conference was mainly for physicians I didn't feel comfortable giving a physics talk in that surrounding as I could neither present cutting edge research nor did I want to belittle them with a general talk about new technologies. Due to the sanctions, Iran might struggle to keep up with obtaining the latest technology, but I was pretty sure that in terms of knowledge and access to papers there was no deficit. The détente following the Iran nuclear deal in 2015 opened a brief window to bring new equipment into the country and Iran is now starting to implement IMRT and VMAT techniques. It was therefore agreed that I would hold some sort of "workshop" about intensity modulated techniques for physicists, where I would share our experience with these techniques rather than give a theoretical lecture. I was to give two talks on two different days.

A week before the conference I was told that five TPS workstations had been organized and that I should give more of a hands-on workshop than just PowerPoint presentations. Trying to prepare everything from far away and not knowing what kind of data was on these workstations and which algorithms had been configured, created somewhat of a challenge, but I decided to bring as much as possible with me and then to look on the spot what to do with it. But when I started to prepare the workstations, there was an issue with my external hard drive not being recognized. An attempt to "help" me in enabling the USB port resulted in my hard disk being repartitioned and all data being lost. It's quite a paralyzing moment, so much I couldn't even get upset! Obviously, the person responsible for that faux pas felt very bad and offered right away to organize CT images from a hospital nearby. This was done very quickly and gave me an unexpected insight into the contouring done at that hospital, apparently one of the first/only ones to do IMRT. There's nothing I could have taught them better about proper contouring for IMRT, down to a very consistent naming convention.

Approximately 20 people showed up for the 1st part of the workshop, which consisted of PowerPoint presentations. We then decided to offer the hands-on part on the 2nd day twice, because so many people sharing 4 workstations wouldn't have been beneficial.

I spent most of my time in Tehran in the conference hotel, apart from one dinner in a restaurant close by where we had the privilege to witness Iranians celebrate a wedding. There was dancing and singing – officially not allowed – and the women's headscarves started to come down as the light got dimmer. I very much enjoyed the small setting of the workshop as it gave me a great opportunity to directly engage with people, much more so than giving a talk in front of a big audience. From previous visits to Iran I knew what a friendly and hospitable people the Iranians are and it was just a delight to again spend time with some of them. The conference taking place in February allowed me to realize a decade old dream of mine: to ski in Iran. Most people associate Iran with a hot climate and desert, but the Alborz mountain range in the North of Iran is just as great as the Alps, in fact greater for some of its peaks reach greater altitude than the highest Alpine peaks. Its ski resorts are small and most of the lifts a bit outdated, but that does not lower the quality of the runs, some of them being true blacks.

Regina Seiler, Lucerne

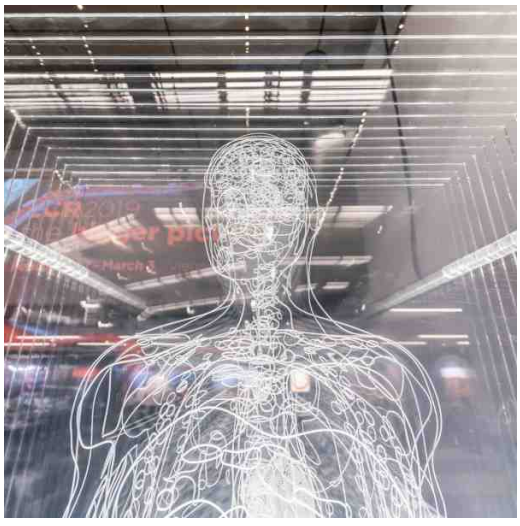
European Congress of Radiology 2019 - The bigger picture

Wien, 27th of February - 3rd of March 2019

The European Congress of radiology was held as usual in beautiful and welcoming Vienna from 27th of February till 3rd of March. This time the congress celebrated its 25th anniversary!
Impressive, that this year ECR hit a new record: 30 259 participants from all over the world. But not only the number of participants is constantly growing, the congress is also getting mature and more attractive for visitors due to the wide range of scientific and educational sessions suited to everyone: from beginners to advanced professionals. This year the organisers of ECR proposed to reflect the journey of European Radiology through the past years and to create the new prospective for the future. That's why it has been called "The bigger picture". This theme has also influenced the scientific program in general and the physics part in particular.

This year, the talks within radiation protection sessions were not focused on radiation dose alone, but rather on complex methods, maximizing the benefits for both patients and clinicians, improving the processes and workflow. Special attention was given to the ethical issues, communication and patient comfort. Personally, I completely support this vision. I believe, that dose optimization, for instance, can be only performed with simultaneous control of image quality, taking diagnostical needs and clinical workflow into account. Moreover, I think that this approach would lead towards more efficient collaboration between clinicians, medical physicists and radiographers.

This year besides traditional sessions on image quality and radiation dose, the physics part included the newest clinical results from the 7T MRI and the rapidly growing field of 3D printing in medical imaging. The special focus was given to artificial intelligence (AI) and big data analysis in medical imaging. A panel of experts presented their vision of AI applications within following sessions:



- Artificial intelligence in hybrid imaging
- Artificial intelligence and radiation protection
- dedicated New Horizons session
- many others...

This fast-growing trend has been also recognized by the vendors and this year many of them presented their novel systems and solutions utilizing AI for different radiological tasks.

Siemens Healthineers, for example, presented its AI-Rad Companion Chest CT, a software assistant for radiology powered by AI technology. This algorithm can highlight distinct structures in the thorax as well as spot potential abnormalities.
GE Healthcare and Canon Medical Systems demonstrated their new CT systems, equipped by deep-learning image-reconstruction technologies, allowing for reconstruction of the low-dose CT data into high-resolution images with natural-looking texture.

Do not forget, that the ECR has always been a creative meeting. This year they surprised us with a new campaign called “Women in Focus”. Several sessions such as “Women in challenging environment” aimed to discuss the challenges encountered by women in the field of Medical Imaging and help younger female attendees to learn from the experienced role models. One organizer of the “Women in Focus” program, Prof. Hedvig Hricak, said that the key ingredients for success are perseverance, focus and courage, and we just should follow our passion to reach our goals.
I completely share this opinion!

Saltybaeva Natalia,
USZ Zürich

To bee or not to bee...

What's new in La Chaux de Fonds Hospital?..... Bees of course!

In agreement with the hospital management, the physic's team installed 5 hives on the hospital's roof top. The place is far enough from the helicopter platform and also protected from the west wind. After a brainstorming to find names - Nobel prices? Famous Physicists? - we simply decided to give the names of the 'Suisse romande cantons' as NE, GE, VD, FR, JU. Sorry for VS, but we need to expand with a 6th hive...

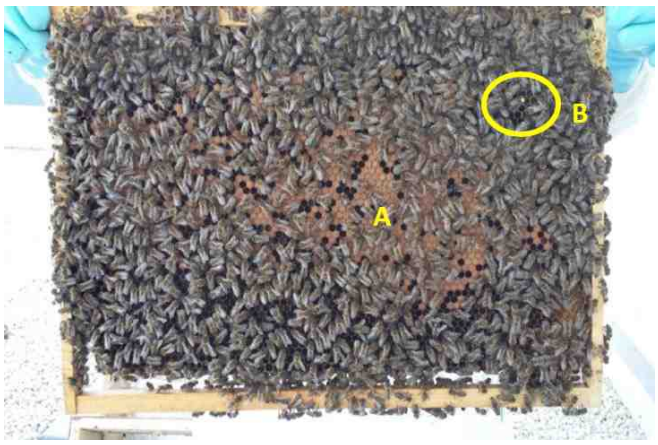
The beekeepers. From left to right : Patrick Weber, Claire Tamburella, Geoffroy Guibert

A : Bottom board : entrance of bees
B: Box with frames containing brood and eggs
C : Box of frames where the honey is stored.

A year with bees

Spring

We received 4 nuclei (queen bee + frames of bees) in May 2018, to populate: NE, GE, FR and VD. During the spring, a queen bee can lay about 1500 eggs per day. As the population expands very quickly, the hive needs to be checked once a week to avoid an 'over bees density' which makes them swarm (the queen bee is leaving with the half of the bee swarm). Unfortunately, we were not able to avoid it and NE bees escaped, leaving us with 3 hives: GE, FR, VD, and the half of NE.



Frame full of bees and brood (A)

B: With the yellow mark: the queen bee

Summer

The population was still growing, and we could create a new baby: the JU hive. Nevertheless, at the beginning of july, physicists beekeepers were desperate: FR and VD had only a very small quantity of honey, GE nothing and NE recovering from their own revolution. Please, don't see any comparison with real cantons and what happened with our bees!!!

Mid of July, the beginning of the summer in La Chaux de Fonds... All bees started to find a lot of food, giving us one month later, 50 kgs of honey with a taste of fir tree and lime tree. All the production was sold by the cafeteria, to patients and HNE staff.

The honey extractor : using centrifugal force, the honey is extracted from the frames

Autumn and Winter

The new site during the works on the roof.

The weather in autumn was still very nice and warm. Bees could still find a lot of pollen to make a comfortable food supply for the winter. Unfortunately, we learned that the hospital had to do major works on the roof during 2019. Then, in November, we moved them from the 8th to the 4th floor. Certainly, hives lost their roof eave and are not protected anymore from the weather, but it can sometimes be an advantage: everybody knows that the snow is a very efficient insulator against very low temperatures!

After hibernating along the winter, we observed activity around the 5 hives. It means that they are all still alive, they accepted their new place and they are waiting for the spring to rebuild a new population. We hope 2019 will be a good vintage!

Claire Tamburella,
La Chaux de Fonds

PhD platform: Miriam Krieger

Towards ultrasound guided proton beam tracking for lung cancer

Motion management is a key point in the treatment of lung tumours, particularly so in scanned proton therapy. The most elegant solution to mitigate the motion effects would be to follow the tumour with the proton beam in real time. However, knowledge of the three dimensional deformation is needed in order to account for density changes and motion interplay effects, which is challenging to extract directly from on-line imaging. Our approach to solve this challenge is to build a statistical motion model correlating simultaneous acquisitions of 3D+t lung MRI and 2D+t liver ultrasound images before treatment. At the time of treatment, the motion model can predict a full lung deformation field in real time based only on on-line ultrasound images of the liver.
This project is a collaboration of PSI, the University of Basel and the University Hospital of Geneva. My part in this project consists mainly in simulating lung treatments under variable motion captured by the 4DMRI and investigating the effectiveness and accuracy of tracking lung tumours based on the statistical motion models. Due to a lack of matching patient data, artificial 4DCT datasets are created to mimic variable motion of a lung tumour patient by extracting deformation vectors from a volunteer MRI and warping a static reference CT.

Part 1: Before the treatments could be simulated, our 4D dose calculation algorithm needed to be validated experimentally. For this, experiments were performed using a scintillating CCD camera and a moving platform. The measurements were then compared to the dose distributions predicted by our 4D dose calculation. We found that our algorithm is able to predict complex dose distributions with high dosimetric accuracy. Even in the case of not precisely known inputs, it can predict the effectiveness of different motion mitigation approaches with sufficient accuracy (**PMB 2018**).
Part 2: Our way of generating pseudo-4DCT datasets needed to be validated as well. 4DCT as well as 4DMRI images of our 4D thorax phantom 'LuCa' were acquired and corresponding pseudo-4DCT datasets were created. We found that our approach leads to reasonable 4DCT datasets that can be used for 4D planning studies (**ESTRO 2018**).
Part 3: Using the results of the first two parts, a planning study was performed to investigate possible ITV definitions in the case that the respiratory variabilities of a patient are known. It was found that a probabilistic ITV definition, including all voxels which are covered in at least 50% of the breathing cycles, can sufficiently cover the tumour while reducing the dose to healthy organs (**ESTRO 2019**, to be submitted).
Part 4: Based on the predictions of the statistical motion model of the liver US images, proton beam tracking of lung tumour patients was simulated and compared to tracking with ideal knowledge of the motion (ground truth). First results show a promising recovery of the static dose distributions through model-based tracking (**ICCR 2019**).

This project builds the foundation for the future treatment of lung patients using the tracking method. It will be interesting to compare our tracking simulations to measurements once the delivery will be technically feasible.

Interview with the Doctor

What brought you to choose this topic for your PhD?
My master's thesis was part of the clinical implementation of 4D treatments at PSI, where I gained some insight in this interesting area. I loved the challenges that came with the complexity of this topic and that there were still many unknowns. When I heard about this PhD position to study the subject of 4D in more depth, it was clear that I had to apply for it.

What did you enjoy the most about the project?
I love that it includes many different aspects. We use various imaging modalities like ultrasound, MRI and CT, but the project also involves 4D (physical) phantoms as well as many simulations, which makes it very diversified. The collaboration with other institutes is very enriching as well.

Which part of the project was the most challenging?
Coordinating the timeline of the project with the other PhD students, making sure that we could make use of each other's work, was sometimes challenging. Also, there are many exceptional parameters in 4D studies, which can make it difficult to extract the relevant information.

What impact do you think your results will bring to the med phys society/world etc.?
I believe my results give an important insight about the possible benefits of proton beam tracking and the handling of variable respiratory motion in general. Even in the case that our approach will never be used clinically, it can serve as a basis for further research and developments.

Would you do it again?
Definitely!

What are your plans for the future?
I would love to train to become a clinical medical physicist and see the story from a different perspective, always trying to offer improved treatments to the patients.

Zuger Kantonsspital

The Zuger Kantonsspital (ZGKS) and the Luzerner Kantonsspital (LUKS) joined forces to establish a new radiation oncology department in Baar (ZG), the location of the Zuger Kantonsspital. To our knowledge, the agreement between these two hospitals of different cantons is unique in Switzerland in that ZGKS built the annex to the existing hospital and is now the landlord to LUKS that is renting the premises, bought the linac and provides all staff. The radiation oncology in Baar is located at the Zuger Kantonsspital, but is to 100% a department of the Luzerner Kantonsspital.

Construction of the annex to the hospital started in December 2017 and in October 2018 the new TrueBeam was delivered. Commissioning took place in November and December. Before going clinical in January 2019, an event was held for referring physicians and on another day an “open house” for the employees of the two hospitals, ZGKS and LUKS. On that occasion a very special guest seized the opportunity to surprise the visitors.

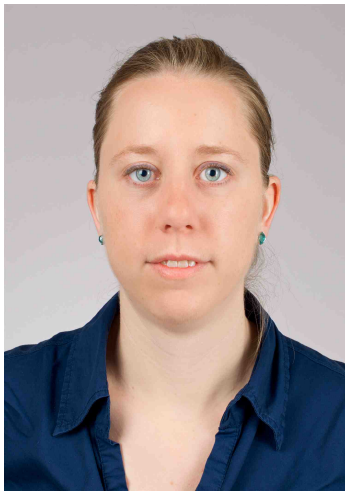
The new site in Baar allowed Lucerne to take its oldest linac, a 600C from 2003, out of service as it was replaced with a new TrueBeam in a different vault, in Baar instead of in Lucerne. This currently leaves Lucerne with two linacs (a TrueBeam and a Clinac 21iX) and an empty vault. Because the TrueBeam's treatment spectrum with VMAT, stereotactic therapy, kV-imaging incl. CBCT is so much wider than that of the 600C, we are hoping for a more even distribution of the patients among the three machines, which should reduce the extended working hours in Lucerne. Even though the machine in Baar filled up rapidly, we have yet to see an effect in Lucerne that would allow us to return to one shift.
Patients are being seen by the physicians in Baar and then need to travel to Lucerne once for their CT scan. The bulk of therapy planning is performed in Lucerne, but the third therapist in Baar is planning as well when not replacing someone working on the TrueBeam. There is a regular transport service between Lucerne and Baar with which individual immobilization devices (mask, vac-fix) are being transferred from Lucerne, where they were created, to Baar.

The team at the KSZG consists of two physicians, one medical physicist, three therapists, a secretary and a nurse. Since they are all part of the bigger LUKS team, absences are covered through staff otherwise working mostly in Lucerne. For physics, this means Peter Egli is the main responsible physicist for the site in Baar, with Tino Streller being his backup.

Tino Streller & Peter Egli

"Welcome!"

Jenny Gorgisyan



Medical Physics is to me a great profession; it combines medicine with physics, getting the best out of two very different worlds. I obtained my Master's degree in Medical Physics in 2013 after which I started working at the University Hospital of Copenhagen in the Radiotherapy department. In addition to the daily routine work, including e.g. quality assurance and image guidance, I developed a special interest in lung treatment and the complexity that treating a moving target brings.

When a great opportunity to move to Switzerland appeared, I did not hesitate long and soon I started a PhD project at the Paul Scherrer Institute (PSI) in Villigen. Here I performed simulations and experiments to investigate how to treat lung tumors with proton therapy in a safe way using the breath-hold technique.
I defended my PhD thesis at the University of Copenhagen at the end of 2017.
Due to both a great professional environment and personal reasons (and of course the mountains and the lakes), I made the decision to stay longer in Switzerland.

Now I am happy and excited to work clinically again, this time with a great team at CHUV in Lausanne. I look forward to further develop my skills and knowledge as a Medical Physicist here.

Jenny Gorgisyan,
CHUV Lausanne

Nanta Fachouri

It was spring of 2013 when the secretary of the Aristotle University Physics Department received a peculiar request. "Could you give me back my graduation application form? I don't want to graduate. I have been offered a student project in Switzerland", said the young girl. Thus it began...

Two years and 3 relocations later, she returned to Switzerland, defying the popular opinion that "sure, protons are cool, but you won't always find a job. That's just a tiny part of medical physics." Yet, it is protons that would accompany her to this day.

This stubborn Greek can be found playing with protons at PSI's Center for Proton Therapy or running around Switzerland climbing, snowboarding and prepping for the SGSMP certification exam.

Nanta Fachouri,
PSI

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Impressum

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Call for Authors

Also, you are invited to participate in the construction of our bulletins. Of desirability are all contributions that could be of interest to members of our society, such as

- Reports of conferences, working group meetings, seminars, etc.
- Reports on the work of various committees and commissions
- Succinct results of surveys, comparative measurements etc.
- Short portraits of individual institutions (E.g. apparatus equipment, priorities of work, etc.)
- Reports on national and international recommendations
- Short Press Releases
- Photos
- Cartoons & caricatures
- Announcement of publications (E.g. books, magazines)
- Announcement of all kinds of events (E.g. conferences, seminars, etc.)
- Short articles worth reading from newspapers or magazines (if possible in the original)
- Member updates (E.g. appointments, change of jobs, etc.)

The easiest way to send your document is as a MS Word document via email to one of the editor addresses above.

Deadline for submissions to Bulletin No. 95 (02/2019): 07.2019

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Conference Calendar

CALENDAR 2019

April 26
Milan, IT

ESTRO 38
April 26 - April 30
https://www.estro.org/congresses-meetings/items/estro-38/

May 27
Bern

SSRMP AMP Meeting
http://ssrpm.ch/event/amp-meeting-may-2019/

June 5
Angers, FR

58èmes Journées Scientifiques de la SFPM
June 5 - June 7
https://sfpm-js2019.sciencesconf.org/

June 10
Manchester, UK

58th Annual Meeting of the Particle Therapy Cooperative Group
June 10 - June 15
https://ptcog58.org/

June 13
St. Gallen

Swiss Congress of Radiology 2019 (SCR'19)
June 13 - June 15
http://www.radiologiekongress.ch/

June 17
Montreal, CA

ICCR 2019 International Conference on the use of computers in radiation therapy
June 17 - June 20
http://iccr-mcma.org/iccr2019/

June 19
Montreal, CA

MCMA 2019 International Conference on Monte Carlo Techniques for Medical Applications
June 19 - June 21
http://iccr-mcma.org/mcma2019/

July 14
San Antonio, USA

61th AAPM Annual Meeting
July 14 - July 18
https://w3.aapm.org/meetings/2019AM/

August 29
Lausanne

23rd SASRO Annual Meeting
August 29 - August 31
https://www.sasro.ch/

September 8
Santiago, CI

24th International Conference on Medical Physics
September 8 - September 11
https://icmp2019.org/

September 18
Stuttgart, DE

50. Jahrestagung der DGMP
September 18 - September 21
https://www.dgmp-kongress.de/

November 21
Villigen

53rd SSRMP Annual Meeting
November 21 - November 22
http://ssrpm.ch/event/53rd-ssrmp-annual-meeting/

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!