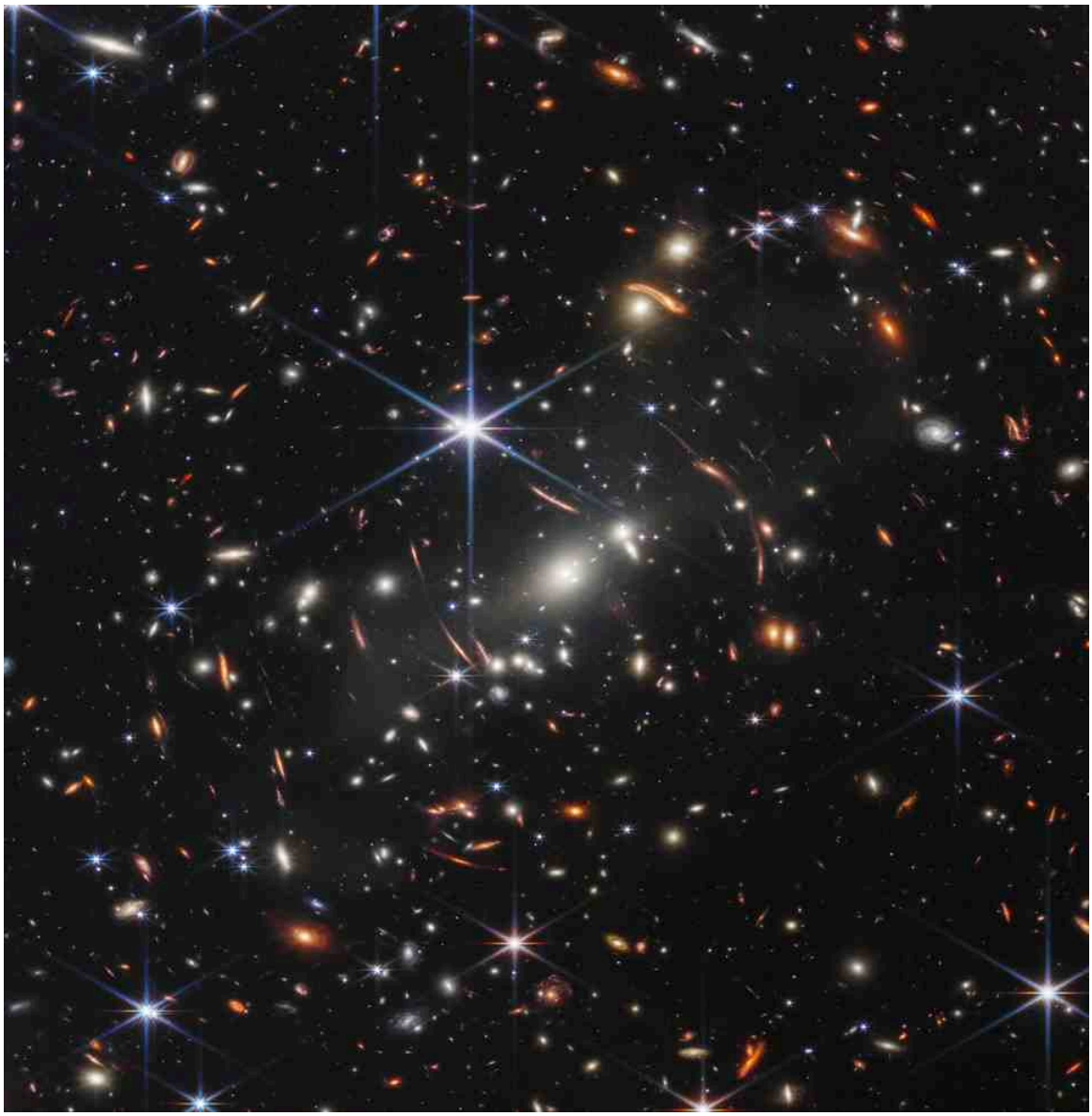
BULLETIN

August 2022



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

No 103 ssrpm.ch

Editorial

Letter from the Editors

Dear SSRMP members,

I hope you have had a great summer so far. With weather like these past weeks, we can't help but be reminded of how lucky we are of being surrounded by stunning natural landscapes. Next time you find yourself at the shore of a beautiful blue alpine (or city) lake, or at a lookout point on a hill or high peak, remember that you actually get paid to be there!
At the same time, appreciating the beauty of this all, shall remind us of the very delicate situation in which our world is now and how much it needs the responsible help and respect of each single individual.

Equally stunning are the first images received this summer from the **James Webb Space Telescope**. Doesn't it sound a bit like science fiction to be receiving images "from the past"? Isn't it crazy that through these images we are made witnesses of how galaxies existed and looked like 13 billion years ago, when the cosmos was just born?
In the first *Deep Field* image used in the cover page, the bright white elliptical galaxy at the center and smaller white galaxies throughout it are bound together by gravity in a galaxy cluster, bending the light from galaxies that appear in the vast distances behind them. The combined mass of the galaxies and dark matter act as a cosmic telescope, creating magnified, contorted, and sometimes mirrored images of individual galaxies. For instance, the orange arcs to the left and right of the brightest cluster are actually lensed galaxies: each individual galaxy is shown twice in one arc. What a marvelous piece of natural art ...

Coming back to earth, less touching, but closer to our daily business is the content of this summer issue of the Bulletin. The SSRMP is still in ferment with a new working group forming, and a complete reshuffle of its board members as well as the Bulletin's editorial team and online platforms management team. **Plenty of opportunities to get involved!** It might seem that these groups and the board's activities are kind of confined in some far away world, but thinking that their outcomes are going to impact and change the workflows and recommendations to be followed in each one's individual department, wouldn't we want at least once to *have a say* in it?
Equally in ferment has been the participation in conferences this year resulting in the Issues of Interest being rich of reports: SASRO workshop on automation, the Radiation Oncology Informatics meeting focused on the evolving involvement and tasks of IT people in medical physics, and the Monte Carlo in Medical Application conference. Thank you very much for every one contributing to these reports!
We do also have a couple of articles looking out onto neighboring societies, like the report from the SFPM congress, and an update on the EFOMP guideline on routine quality control in PET/CT and PET/MR.
Finally, we welcome two new colleagues introducing their interesting stories and background in the Personalia!

Enjoy the reading and the rest of the summer.

Francesca Belosi,
On behalf of the Editorial Team

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BULLETIN 103 - August 2022

SSRMP News

*Cover Image: NASA's Webb delivers **deepest image of Universe yet**. Release Date: July 12, 2022 10:39AM (EDT) Near-infrared image of galaxy cluster SMACS 0723. High-resolution imaging from NASA's James Webb Space Telescope combined with gravitational lensing made this finely detailed image possible.*

Issues of Interest

PRESIDENT'S LETTER

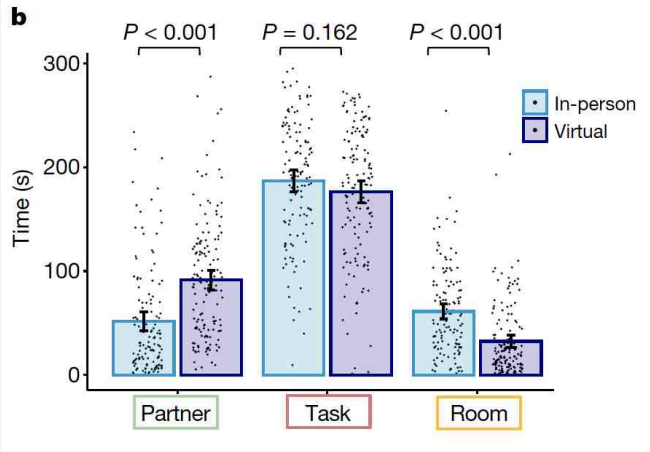
Dear colleagues,

during the last two years plus, we all became used to online meetings and conferences, boosting these modalities substantially as, in principle, remote connection and videoconferencing has been available for a long time. All kind of different platforms and different number of participants from two to thousands proved that, actually, all in all it works better than previously thought. More recently, in-person meetings and conferences are possible again and many of us – including myself – enjoyed meeting colleagues and seeing them from head to toe. However, there is a trend in personal preference for partly remote work even after pandemic ends. In this context, a recent study published in *Nature* (doi: 10.1038/s41586-022-04643-y) is interesting to look at, investigating whether or not in-person interactions affects innovation in terms of generation of creative ideas compared to virtual meetings.

They performed extensive experiments in both laboratory and field with participants across five countries around the world and different level of expertise. Mostly done in randomly selected pairs it was found that in-person meeting generates more creative ideas compared to videoconferencing. The explanation provided is that in videoconferencing the focus of the participants is on the screen leading to a narrower cognitive focus, thus virtual interactions occur on cost of creative idea generation. In contrast for participants of in-person meetings the focus on the partner is reduced and significantly more props in the meeting room are recognized compared to the participants in videoconferencing as shown in the figure on the next page.

Thus, while in-person teams recognize and employ the complete shared room, the virtual connected teams reduce the space to the computer screen. However, when it comes to the selection process from a list of created ideas, the article showed that there is no evidence that videoconferencing is less effective. There is even preliminary evidence that in-person groups are less effective in this selection process compared with videoconferencing groups.

PRESIDENT'S LETTER



Differences in the amount of time looking at one's partner, the task (on a task screen in front of each participant independent of the modality) and looking around in the room by modality.

(Adapted from Brucks, M.S., Levav, J. Virtual communication curbs creative idea generation. Nature 605, 108–112 (2022). https://doi.org/10.1038/s41586-022-04643-y)

So basically, we should all have in-person meetings to generate creative ideas, leave and digest before having a remote meeting for selecting the ideas to proceed with. Maybe you have experienced the same yourself.

Having said this, there will be many upcoming opportunities for meeting in person. One I look forward to is our annual meeting in Thun. I hope that many of you will attend this meeting and I invite all of you to take the chance for generating many creative ideas out of which the best could be selected in a follow-up online meeting, and of which the results can be presented at our annual meeting next year. Another option to participate in online as well as in-person meetings is to **become an SSRMP board member**. As you know there are several open positions to be filled by elections at our next general assembly.

Apart from new developments and implementations of online meeting modalities, there is also a new revision of the **ESTRO-EFOMP core curriculum for medical physics experts in radiotherapy**.

The EFOMP and ESTRO Physics committee established a working group of medical physicists from 17 European Medical Physics National Member Organisations including also medical physicists from our society for this task. So, you are invited to read about what expertise our new colleagues will bring in our clinic.

To finish, I keep my habit and reiterate the message from my previous letters: **Let's stick together within our society in the best possible way.** A big "Thank you" to all of you for your individual efforts and contributions towards your family, neighborhood and society at large. Thank you all and take care!

Michael K Fix,
SSRMP president

SSRMP News

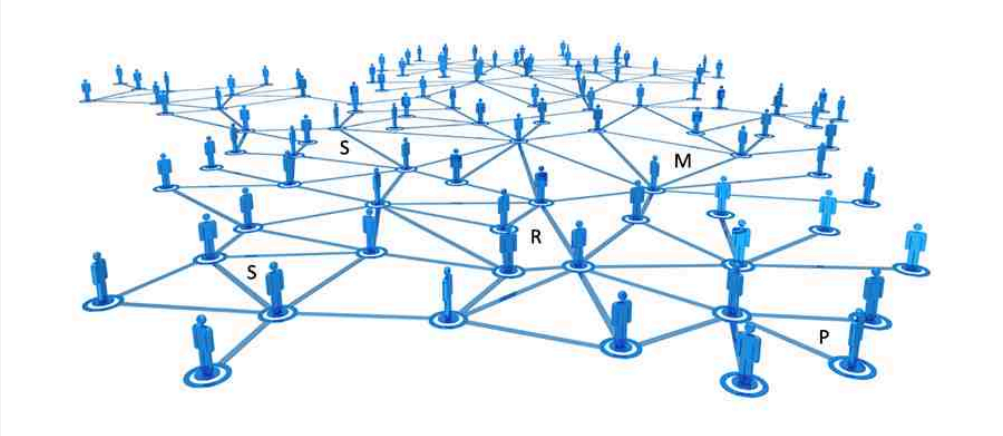
SSRMP Call for Board members

The working groups, committee's decisions and activities of the society impact and affect the way we work daily as medical physicists in our institutes. Take the opportunity to get more involved with this!

There are several open positions to be filled by elections at the general assembly that will be held during the SSRMP annual meeting in Thun, on October 27 (**https://ssrpm.ch/event/55th-ssrmp-annual-meeting/**):

- New **President**
- New **Chair Professional Affairs Committee**
- New **Chair Science Committee**
- New **Board members**

Get in touch with board members for more information!



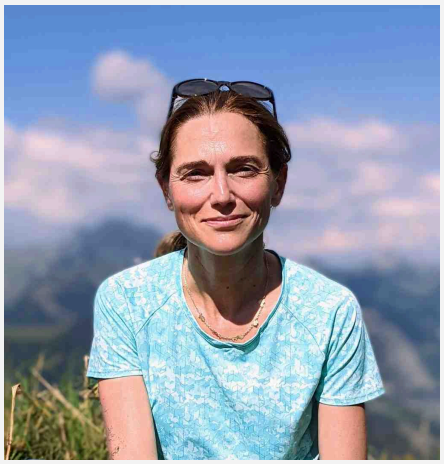
Michael Fix,
SSRMP President

PROFESSIONAL AFFAIRS

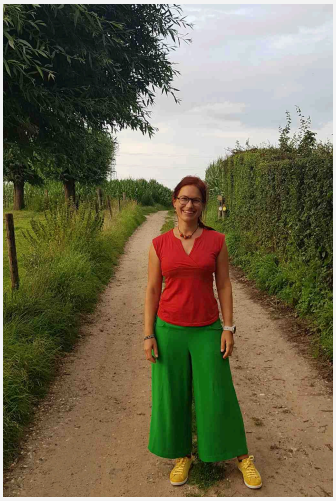
Introducing the New Members of the Editorial Board

Last November, SSRMP invited applications for the positions of members of the editorial board. The editorial board manages the communication platforms of the society. The **Bulletin**, the **newsletters** and the **websites** are key components of how our society communicates with the members to provide useful and timely information. The development of modern communication tools has enabled the SSRMP to broaden the information it offers to their members and related community. This attractiveness has led to an increase in the resources needed for its operation.

We are very happy to present the new colleagues willing to put their enthusiasm into this informative and valuable communication tool of our society.



Marie Fargier-Voiron *(Genolier) and* **Davide Cester** *(Zürich) are keen to take on a new challenge by continuing the* **Bulletin***'s adventure.*



Anisoara Socoliuc Toquant *(Lausanne) and* **Lotte Wilke** *(Zürich) are very keen to take over the* **digital communication**.

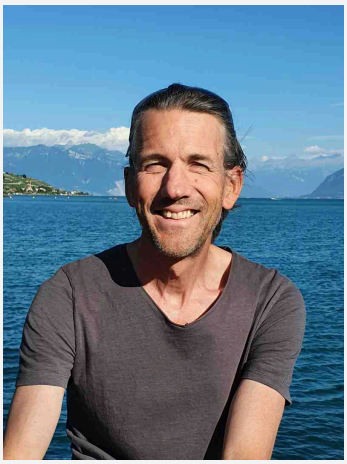
PROFESSIONAL AFFAIRS

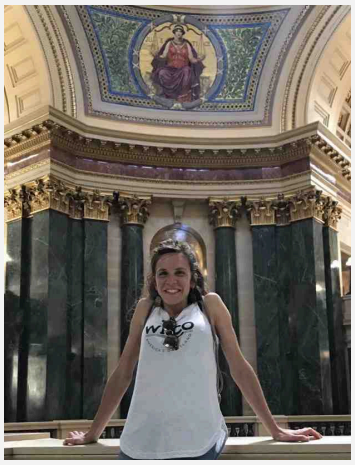
Operating with several communication channels, a combined strategy is needed to take advantage of each platform and its specific audience.
The new team will work closely together to achieve this goal.

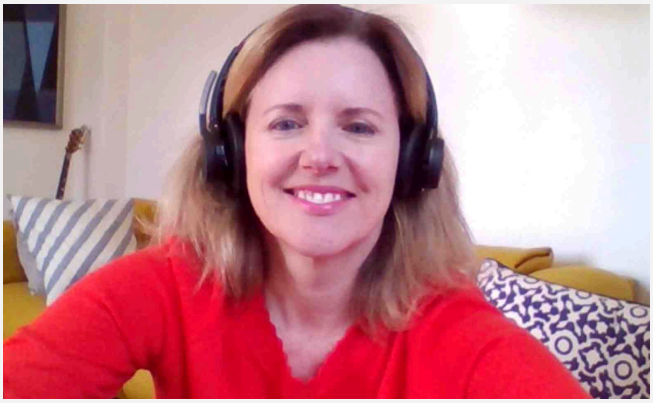
They will be able to count on the unwavering support of the former members who have carried this project for so many years.

We wish them every success.

Francesca Belosi and Jean-Yves Ray







PROFESSIONAL AFFAIRS

Main Tasks of the Editorial Board

The Editorial Board supports for public relations activities and for the dissemination of information on SSRMP activities to promote the science and education in medical physics in Switzerland:

- reviews all material submitted for publication for suitability and timeliness;
- reviews when necessary any material that is questionable or inflammatory;
- solicits articles and new items of interest;
- develops and maintains a contact network within the different regions;
- suggests, proposes and stimulates the regional community to contribute to the Bulletin content (meeting reports, local activities, research and clinical developments, local press, and so on);
- manages the ssrmp.ch websites and Newsletter's distribution;
- monitors the interest of the membership on coverage and format;
- administrates the digital platforms;
- participates in the development of communication platforms with the support of an external company;
- makes them evolve for the younger generation who is more active on social networks: a further evolution of the communication platforms could be an attractive project;
- meets with the executive board of the society to adjust the editorial line.

EFOMP Guideline on PET/CT & CT/MR Quality Controls

1. Introduction

An EFOMP working group (WG) was formed to propose a Guideline on a routine quality control schedule to be performed on digital and non-digital PET/CT and PET/MR systems. The aim was to identify a set of QC tests that would be simple and easy to perform without the need for special phantoms and sophisticated software for image analysis to ensure the operational status of the PET devices.

The guideline considers PET systems with an axial field of view below 30 cm, but all the tests can be extended to the larger field of view scanners. Thus, the current guideline does not present any test specific to long AFOV devices.
The Protocol describes the quality control procedures of radionuclide dose calibrators, weighing scales, PET, CT, and MRI scanners using selected and measurable parameters directly linked to clinical image quality. It helps to detect problems before they can impair clinical studies in terms of safety, image quality, quantification accuracy, and patient radiation dose. CT and MRI QC are described only in the context of their use for PET (attenuation correction and anatomical localization) imaging.

A regular QC based on the proposed protocol would guarantee that PET/CT and PET/MRI scanners operate under optimal conditions, resulting in the best performance in routine clinical tasks.

2. Guideline main characteristics and key points

2.1 Rationale

A quality assurance program should start with acceptance tests, which are intended to verify that the scanner is operating according to the manufacturer's specifications. The acceptance tests are performed following the vendor's specifications based on international standards. These provide uniform and consistent methods for measuring and reporting the specific performance parameters of a scanner. The international standards of reference are published by the National Electrical Manufacturers Association (NEMA) and the International Electrotechnical Commission (IEC) and are regularly reviewed and updated to include technological innovations in the equipment.
After acceptance, a QC program is specifically required to test the constancy of the performance of the equipment throughout its lifetime. Its content may differ from that defined by the international standards of reference. All acquisitions and evaluations must be available to a regular user.
The QC protocol should describe the tests to perform and their periodicity: the results obtained during the first few executions after acceptance will establish baseline data and tolerance for comparing all future QC results.

2.2. Key points

The key points of a QC Protocol include the definition of the different types of tests, the frequency, tolerances, corrective actions and record keeping. Additionally, it describes the responsibilities: it highlights that the Medical Physics Expert (MPE) is responsible for the overall supervision of the QC program, including supervision of tests performed by other professionals (e.g. technologists).

2.3. Instrumentation

The Protocol tests are grouped in several chapters, one for each piece of equipment. Each test is accurately described to facilitate the phantom preparation when needed, the test execution, and the image analysis.

The equipment list includes in addition to the imaging devices the radionuclide dose calibrator (activity meter) and the weighing scales. For the radionuclide dose calibrator, it states that any routine manufacturer QC should be performed including physical inspection, background check and a constancy test daily, and accuracy, precision and linearity tests annually. Additionally, inter-calibration run annually on all the radionuclide calibrators of a PET centre can guarantee the homogeneity of readings of different calibrators with a clinical isotope.

PET uptake is normalized by the injected activity and patient weight to give units of Standardised Uptake Value (SUV). Since SUVs are based on body weight, the weighing scales used to measure the weight of the patient need to be accurate and precise for the determination of the SUVs in addition to the amount of administered activity. Weighing scales should be checked by a physical inspection (free from damage, powered by batteries, accurately levelled, zero value displayed before weighing patient, accurate weighing scale selected) and for their accuracy and precision on an annual basis, by using calibrated weights.

Four appendixes to the Protocol were added, three of them contain detailed information on specific QC procedures (Routine Manufacturer QC on the PET component or Daily Quality Controls, Quality Control on the CT component, and Quality Control on the MR component). In the fourth appendix, a template for reporting QC results is presented.

2.4. QC for accreditation

Several PET system accreditation programs are being followed in the EU, such as EARL, UK PET Core Lab, Italian Foundation on Lymphoma and the SNMMI Clinical Trials Network. Quantitative biomarker imaging needs to be repeatable, reproducible, and comparable. The latter two points are also important for clinical care when quantitative PET metrics are used for diagnosis, prognosis, or prediction. Therefore, the main aim of these programs is to harmonise image quality and quantification across imaging sites to facilitate multicentre trials or to use quantitative PET biomarkers in routine care.

Accreditation programs aiming at PET performance harmonisation have published lower and upper limits for recovery coefficient as a function of sphere size for the metrics SUVmax, SUVpeak and/or SUVmean. Furthermore, image background noise must be below predefined levels. In several programs, the accreditation process is repeated quarterly (calibration) or annually (image quality) and ongoing (re-)accreditation is granted when the PET system and acquisition/reconstruction protocols meet the required accreditation criteria. In this way, constant PET system performance is guaranteed.

2.5. QC for radiotherapy applications

The key aspects for any QC program are tests for PET to CT (or MR) alignment and integrity of the data when imported into the planning system. This ensures the PET data is displayed appropriately and can be correlated with anatomical data from CT and MR.

Where the highest levels of accuracy and precision are required for outlining the biological tumour volumes, the positioning of the patient is critical. In this case, the PET system and its associated positioning system must be commissioned and undergo routine quality control testing in line with the guidelines for CT simulation in radiotherapy applications.

3. Conclusion and remarks

The EFOMP protocol QC on PET/CT and PET/MRI was designed to detect any variations in the device's performance by using chosen and measurable parameters directly linked to the clinical image quality. The reasoning for this document was to produce QC tests without the need to have specific phantoms and sophisticated software for image analysis.
The aim of these proposed protocols was to guarantee that PET/CT and PET/MRI scanners operate under optimal conditions, resulting in the best performance in routine clinical tasks.
Additional concern has to be given when dealing with multicenter comparisons and large data comparisons as the ongoing technical, radiopharmaceutical, and clinical trends will increase further the complexity and heterogeneity of clinical PET/CT and continue adding challenges to its QC. Therefore, contemporary PET/CT site-based QC, including accreditation schemes, may not meet the quality demands of multicenter clinical studies for quantitative PET/CT. Present-day PET QC is actually PET quality assurance (QA) combined with some instrumentation and process QC. It misses a concluding and systematic inspection of the individual clinical PET/CT image itself, (and no official guidelines foresee such a process), whether contemporary QC verifies protocol adherence, nor if the chosen set of imaging parameters makes physically and medically sense at a given PET site.

Because the correct choice for a particular set of imaging parameters depends on the clinical question asked on available instrumentation, it should be determined from a preceding PET/CT system characterization. For this reason, a standardized global accreditation program will always deliver sub-optimal PET/CT images in multicenter clinical trials. Furthermore, PET system accreditation programs, such as EARL, allow for up to a 20% spread in their quantitative metrics. A trial-specific accreditation could reduce this spread by an order of magnitude and thus deliver PET/CT images optimized for the respective clinical question and to the benefit of the patient.

Therefore, PET QC should also consider the validation process that is not limited to the hardware, the software, phantom images, and measurements, but also includes the validation of the resulting clinical image after acquisition and before the inspection by the nuclear medicine physician. Because a manual inspection of large numbers of clinical datasets and associated meta-data is time-consuming and prone to error, dedicated tools and processes must be developed. Extending QC to the level of the individual clinical image will ensure that future expectations for the latest generation of PET devices as well as the needs of clinical research are met in the face of an ever-growing diversity of PET/CT applications.

Thiago Lima
Institute of Radiology and Nuclear Medicine, LUKS
Department of Health Sciences and Medicine, UniLu
Luzern

George Prenosil
Department of Nuclear Medicine, Inselspital and UniBe
Bern

SCIENCE

New SSRMP Working Group on MR-only radiotherapy

Dear colleagues,

during the last years, the use of magnetic resonance imaging in radiotherapy has become increasingly important and the exclusive use of this technique from simulation to planning is no longer a mirage but quite a near future. Obviously, a radiotherapy workflow based only on MR images must lead to a treatment as accurate as the one based on the standard CT scans, but the peculiarities of MR make it challenging. Nowadays, general reports or recommendations about a safe introduction of an MR-only radiotherapy workflow do not exist and that is why a working group has been proposed and approved during the last AMP meeting in June 2022.

The working group aims to identify the critical issues related to the implementation of this new radiotherapy workflow and to provide procedures related to commissioning and quality assurance. Since different approaches exist, it is of great importance that everyone who works on this topic contributes with his experience to this working group.

If you are interested in participating, you are welcome to contact:

Lisa Milan
Ente Ospedaliero Cantonale
6500 Bellinzona
Lisa.Milan@eoc.ch

In September/October 2022 a meeting will be set up in order to start with the project.
I would like to thank all participants in advance!

Lisa Milan
EOC, Bellinzona

SCIENCE

SASRO 2022 Announcement

Save the Date:
September 1-3, 2022

Congress venue:
Trafohalle Baden
Brown Boveri Platz, 1
5400 Baden

Congress President:
Prof. Dr. med. Oliver Riesterer
Chefarzt Radio-Onkologie-Zentrum KSA-KSB
Kantonsspital Aarau

Registration:
Open!
https://www.sasro.ch/sasro-2022/registration

4th St. Gallen Radiation Oncology Informatics Meeting

St. Gallen, 25th of March 2022

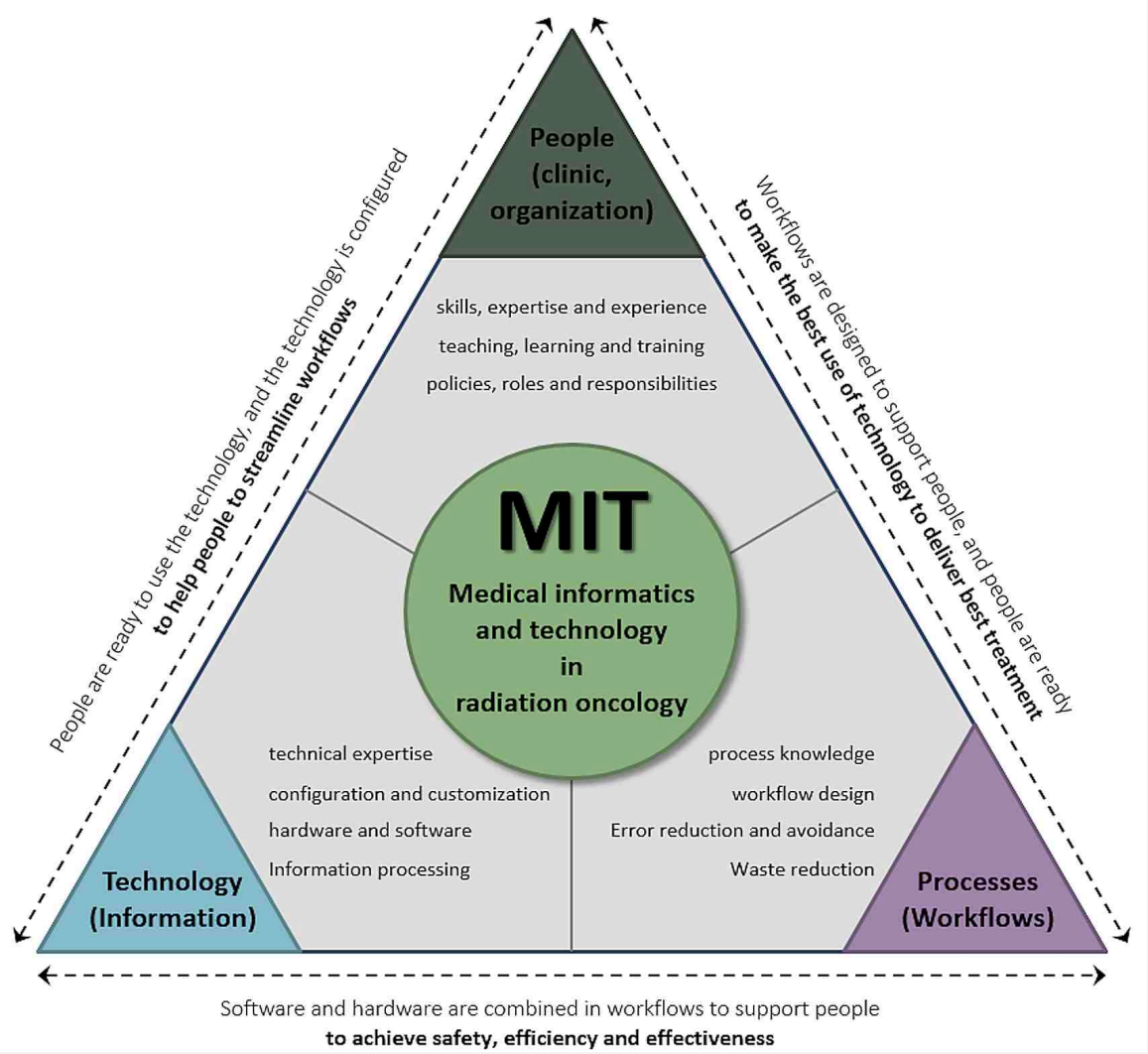
During a time of covid-related uncertainties, we were all the more happy that on March 25, 2022 we could finally execute the 4th St.Gallen Radiation Oncology Informatics Meeting as an on-site event!

Inspired by the KAI-DEGRO workshops in Freiburg, Germany organized by Dr. Felix Heinemann, the first Swiss meeting took place in 2015 with a small group of people interested in exchanging ideas about the use of radiation oncology information systems and workflows. The 2nd and 3rd meetings, with growing participation and a broader range of topics were held in 2017 and 2019.

Based on discussions from the 2019 meeting, a society was founded in May 2020 in coordination with colleagues from Freiburg: the **International Society for Radiation Oncology Informatics** (ISROI). Its mission is "to improve patient care and outcomes by advancing radiation oncology informatics through multidisciplinary and international collaboration". An essential part of this is to accompany and advance the comprehensive digitization of radiation oncology, to create standards and to establish and ensure technical and semantic interoperability. Thus, for the first time, this year's meeting was officially held on behalf of ISROI. As personal exchange and discussions were the essence of these meetings, we decided to have it on-site only. Thus, this year's meeting started on Friday morning with almost 50 participants, mainly from German-speaking countries and also a few colleagues from the French-speaking part of Switzerland. Medical physicists, IT specialists, physicians, technicians, clinic managers and others were present demonstrating the multidisciplinary nature of the society and topic. It is not possible to reflect the content of all presentations and the sometimes very lively discussions in merely a few lines. Only a few key points will be mentioned here.

The meeting was introduced by an overview of what digital transformation actually means and its role in the hospital environment: it is not primarily about the application of new tools, techniques and the associated knowledge. The whole must be embedded in the overall understanding of the processes, the manners and the clinical culture as well as their change. In the subsequent discussions and presentations, this was often reiterated: the progressive digitalization of radiation oncology departments is about networked, cross-departmental and cross-clinical collaboration, in order to create a clear benefit for the patient based on useful clinical data!

The morning was dominated by more general topics, while the afternoon focused mainly on application-related solutions for everyday clinical practice. Thus, after the aforementioned overview of digitalization, the key role of



The role of IT-specialist in radiation oncology departments, taken from "Need for IT specialists in RO departments - The role of medical informatics and technology @ Radio-Onkologie-ZentrumKSA-KSB", Micheal Heuser, ISROI-Meeting, 2022, St.Gallen - with kind permission of the author.

IT security and data protection became very clear in two presentations. As it is well known, the number of cyber-attacks is constantly increasing and as applications increasingly offer cloud-based solutions, one is more exposed to these risks, including legal uncertainties. Still it became clear that it is possible to manage patient data in the cloud securely if the appropriate technical and regulatory measures are in place.

A more direct reference to radiation oncology was created by two very comprehensive presentations about semantics of oncological terminology and natural language processing (NLP). It seems clear that digitization is about generating good data that then can be put to good use. However, there are still many open questions in the standardization of oncological semantics, which in turn form a basis for the meaningful use of NLP. After all, we will only have truly complete patient data at our disposal if they can be recorded practically and, if possible, in a natural form. But we are still a long way from that!

The second part of the meeting was mainly characterized by the presentation of various practical solutions on how collaboration, workflows, data processing and software interfaces are applied in different departments.
So, by creating and using suitable interfaces, the existing databases and clinic systems can be extended to significantly simplify the processes in the clinic. However, two things

are necessary for this: the willingness of the software manufacturers to support such projects and the ability and knowledge within the clinic to create such extensions.

These insights then led seamlessly to the planed final open discussion: **whether and in what form IT specialists need to be active in radiation oncology departments.** There was a clear consensus that the comprehensive issues of information technology and digitization in radiation oncology can no longer be dealt with by medical physicists, physicians and technicians alone. Specialists are needed to deal with these issues. However, it was widely discussed what tasks these people should actually perform and where and how they could be integrated into the clinic.
Regardless of how the IT specialists are integrated into the clinic, it is essentially clear that such persons should do their work on-site and not somewhere remote. As for the job responsibilities, it is certainly not a matter of having someone on site to replace broken keyboards or plug in network cables. They have to be IT specialists, ideally with a training in medical informatics, who have a comprehensive understanding of the processes of a radiation oncology department. The tasks here include, on the one hand, dealing with the major issues of digitization in the strategic sense mentioned at the beginning of this review and, on the other hand, the more technical implementation, such as support of operationally necessary software and the development of interfaces, evaluation tools and data processing.

Traditionally, medical physicists often perform many of these tasks. With the introduction of IT specialists in the clinic, a cautious approach is necessary to convince the clinic management of the clear benefit of such employees with at the same time not giving medical physics the impression that something is being taken away from it.
In summary, the discussions suggest that IT specialists will increasingly play a central role in the advancement of the radiation oncology clinic.

Three main points can define the role of such persons or teams:

1) Technology: they provide the technological expertise for appropriate hardware and software;
2) Processes: they design and improve workflows and processes;
3) Clinic Organization: they provide the skills, education and training and define roles and responsibilities throughout the clinic.

(proposed by **Michael Hauser** from KSA, see image).

To reconcile all of these points is certainly not an easy task and might prove to be a major challenge, especially for those departments that do not yet have such specialists in the clinic. The discussion also showed that there is a need for detailed clarification of the position, tasks and responsibilities of IT specialists. Thus, it was finally decided that an interdisciplinary working group should be formed within ISROI to address these issues in depth with the aim of producing a corresponding position paper that can be made available to all interested as well as to those whom it concerns.

As it has become customary at the previous meetings, this time too, we met at a nearby restaurant for a pleasant meal and a beer or two after the presentations. The next meeting will take place in St.Gallen in approximately 2 years - there are many more topics that can and will be covered.

On behalf of the organizing committee and the society,
Samuel Peters and Paul Martin Putora
www.isroi.org

International Conference on Monte Carlo Techniques for Medical Applications (MCMA)

Antwerp, 11th - 13th of April 2022

After 2 years of online conferences, the International Conference on Monte Carlo Techniques for Medical Applications (MCMA) was one of the first conferences in our field to take place again in person. In the beautiful city of Antwerp around 300 Monte Carlo enthusiasts met to discuss the newest advances and applications of Monte Carlo techniques.
Hot topics were the fast dose calculation with the help of GPU, interfaces for complex Monte Carlo codes, deep learning, and Monte Carlo modelling on the scale of DNA.

Several advances were recently made to translate Monte Carlo codes to GPUs and show its applicability. In this topic, the award for best presentation went to **Gaia Franciosini** from Italy for her presentation on "*A feasibility study of IORT-Flash using a GPU-based fast Monte Carlo (FRED)*". She showed that accurate Monte Carlo dose calculation for FLASH is possible within seconds of calculation time.

Regarding the second hot topic, presentations from various groups showed how Monte Carlo algorithms based on e.g., PENELOPE or Geant4, can be made more accessible and user-friendly by implementation of graphical user interfaces and application to established (e.g. brachytherapy) and emerging research fields (e.g. micro beam, FLASH).

Several presentations showed the feasibility to train deep neural networks to perform dose predictions with Monte Carlo accuracy. Specifically, the usual limiting factor of insufficient training data sets could be overcome by first performing the dose prediction on CT slice by slice, or by training the neural network with multiple different field setups per patient, or performing the predictions on beamlet level instead of full dose predictions.
A noteworthy application of neural networks in the context of Monte Carlo is to use Generative Adversarial Deep Neural Networks to generate phase space files for Monte Carlo dose calculations. This has the advantage that particles can be generated "on-the-fly", to match the needs of the user.

Great advances in Monte Carlo modelling on the DNA scale including the different time scales (from the physical to the biological stage) have been made: extensions for TOPAS, such as TOPAS-nBIO, have been presented to model radiation induced damage to DNA.

The conference was rounded of by a tasty dinner, accompanied by discussions on how research is conducted and impacted by covid in other institutes followed by a merrymaking party. Especially for PhD students, who have not had the chance yet to meet their peers in such a setting, this was a welcomed experience.

Löbner, Hannes Anton
Inselspital, Bern

Townhall of Antwerp, including the Brabo fountain representing the legend "Antwerp": a roman soldier triumphantly throws the cut of hand (Antwerp) of the giant into the river Schelde.

SASRO Multidisciplinary workshop 2022
One Day Multidisciplinary Workshop on Practical Aspects of Automation

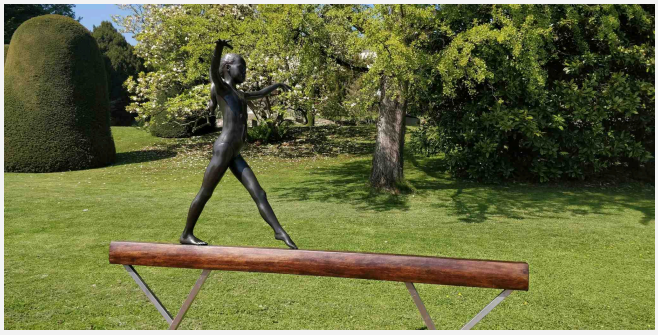
Lausanne, 28th of April 2022

At the End of April the first SASRO One Day Multidisciplinary Workshop on Practical Aspects of Automation took place in the Olympic Museum in Lausanne. Over 100 participants had a great day in which all aspects of automation were covered in a beautiful environment.

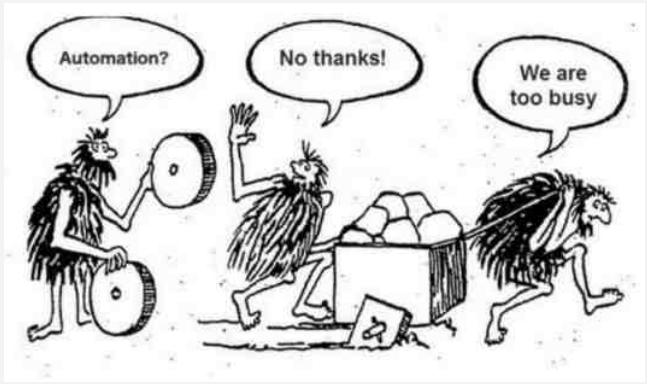
In part 1, **Mischa Hoogeman** from Rotterdam gave the keynote lecture about a fully automated process of treatment planning followed by presentations about the practical experiences gained from automated planning at CHUV and USZ.

Part 2 was a practical workshop that gave everybody the opportunity to compare automated segmentation solutions from different vendors using two real patient cases in a speed dating fashion. This workshop addressed medical doctors, dosimetrists and RTTs who are involved in contouring.

In parallel, there was a workshop aiming at physicists, dosimetrists and RTTs about sharing automated treatment planning models used in their clinic. Four participants presented their models and there was a lively discussion going on.
In parallel to the workshop, an excellent lunch was offered with a beautiful view on the lake.



After the workshops at the end of part 2, all the vendors gave a short presentation about their software solution in front of all participants.



In part 3 we had four presentations from Swiss institutions about different aspects of automation including MR-only planning, automated patient set up, digital workflow in Aria and automated treatment planning workflows.

The workshop provided cutting edge information about state-of-the-art automation and the current state of projects in different institutions in Switzerland. It clearly covered on all professional groups who want to further develop automation in their clinic and promoted the exchange of experience between our colleagues in Switzerland.

Lotte Wilke, Stephanie Tanadini-Lang
University Hospital, Zürich
& Andreas Joosten,
Inselspital, Bern

SASRO Multidisciplinary workshop 2022
Multidisciplinary Workshop on Automation: are we there yet?

Lausanne, 28th of April 2022

After two years of online, virtual conferences and meetings, a hundred participants gathered for this workshop organized by SASRO. Although the pandemic surely took a toll on our social lives, a common topic of discussion between us during the day was how good it felt to be able to meet in person, and how enjoyable it was to catch up with the community. The amazing venue certainly helped, and the coffee and lunch breaks definitely felt a lot more pleasant at the Olympic Museum in Lausanne than at home during online conferences!

The organizers had prepared a dense program around everything that can be automated in radiation therapy, with talks from our colleagues from all over Switzerland, and a keynote lecture by **Mischa Hoogeman** from Erasmus (Rotterdam).

We will however start our report with the very original novelty they tested for this workshop: inviting all vendors to not only present their auto-contouring solutions, but also to showcase the results to small groups of 2-3 participants in quick, 10-minute sessions. Everything was fast-paced (10 minutes is really short when you want to give a talk or perform a demo of your product), but this kind of *speed dating* concept had the merit of giving all vendors a common platform and fair chances to present their product.

So where are we at with automatic contouring?
Well, the answer from everyone was unanimous: *artificial intelligence (AI)*!

"Simply" relying on a database of expert cases and deformable registration is not enough anymore, and the quality of the contours can be significantly increased with the use of neural networks.
While every system is clearly able to produce plausible contours (at least for common OARs, since tricky ones or lymph nodes are another story), the early adopters showed us that most of the time, the auto-generated contours have to be manually corrected, or that a few back-and-forth iterations with the vendor are necessary to fine-tune the models to what they call a *site-specific flavor*.

Although traditionally less directly involved in the contouring workflows, medical physicists have to work hand-in-hand with their MD and RTT peers in order to assess the clinical relevance of minor corrections, help the vendors steer their algorithms towards dosimetrically useful directions (does anyone really need 165 clinical structures auto-contoured in a CT dataset?), while keeping an eye on personal patient data flows in the case of cloud-based solutions. Quite a challenge ahead of us, indeed…

Besides automatic contouring, the second topic that was developed was automated planning, or more precisely automation in treatment planning. As Mischa Hoogeman pointed out, the right balance between objectives and constraints for targets and OARs is a delicate task that remains in human hands. What algorithms can do, however, is fast track the planners towards locally optimal plans, or use AI for predicting what an optimal dose distribution would look like, before attempting to tailor an actually deliverable plan. The ways for accomplishing this differ: Pareto fronts exploration (MCO by Varian, Raystation), sequential

processing of the objectives (iCycle), or knowledge-based (RapidPlan) for example.
Of note, the overwhelming majority of users amongst the presenters for this part used Eclipse and its automation products, either MCO or Rapidplan. The common ground is however always the same: good models take weeks to months to develop for a given anatomical site (as confirmed by both Rapidplan and Raystation users), require good and consistent input at all stages, and will not solve the challenge of intra- and inter-center inhomogeneity in practices for naming, contouring, prescribing, and evaluating a plan quality. Standardization of the vast majority of cases is the key for using these tools, leaving the occasional, challenging exceptions in the hands of well-trained planners.

Finally, the last set of talks focused on other aspects that are evolving towards more automation. Erasmus has developed an impressive (may we dare say *daunting*?) software overlay that connects a dozen of contouring, planning, reporting, and secondary calculation subsystems, which is itself QA'd by yet another home-made software after each update. This shows what is possible with adequate resources, but there is no doubt that armies of programmers scratch their head on a daily basis in Rotterdam!

The other talks each tackled a different aspect of automation: patient positioning with the use of surface tracking, or transitioning from paper to fully electronic ARIA workflows, for example. Again, what emerges in such projects is the necessity for consistency in practice, and constant dialogue between peers in order for such projects to succeed.

So… are we there yet? Not quite, and that is what will make our next years as medical physicists exciting! What we bring back from this workshop is that the magical *out-of-the-box-one-button-contour-and-plan* is still distant science fiction, but that all vendors will eventually get there. Still, and as the speed-dating contouring sessions showed, they remain "vendors" and might be oblivious to essential aspects of our practice. This is where we should remind ourselves that we are not only physicists applying algorithms, but rather *medical* physicists: rest assured that this nuance guarantees us an essential place in the future, automated radiotherapy world!

Cyril Castella, Sandra Strohmeier, Sébastien Schang
Hôpital du Valais, Sion

Cyril Castella and Sandra Stroheimer

60èmes Journées Scientifiques Société Française de Physique Médicale

Avignon, 1st - 3rd of June 2022

After two years of virtual meetings, the scientific days of the SFPM (*Société Française de Physique Médicale*) took place in Avignon, former papal city full of the charm of Provence and cicadas. The congress took place in the papal palace, giving all the solemnity and an incredible *cachet* to these scientific days.

The Papal palace

As in every edition, the program was very rich, with parallel sessions in radiotherapy, nuclear medicine and radiology. There was also a combined session with the SFRO (*Société Française de Radiothérapie Oncologique*). Moreover, we had the privilege to celebrate the 50th anniversary of the SFPM.

In order to add some stress and excitement for the speakers, the sessions took place in the rooms of the palace, the conclave room for radiotherapy and the cellar room of Benedict XII for imaging.

The stereotactic session started with feedback from the ESTRO working group on the harmonization and standardization of stereotactic radiotherapy (**L. Viellevigne**), showing the diversity of practice and the indispensable work of this type of working group. Especially interesting was the feedback from the Dijon team of the CGFL on two treatments that they performed on their MRI-Linac MRIdian for the treatment of refractory ventricular tachycardias with ablative stereotactic radiotherapy, with very encouraging medium-term results (**I. Bessieres**).

The dosimetry sessions focused on breast treatment, with detailed presentations on the hybrid IMRT/VMAT technique, on the new possibilities introduced by the Halcyon, and on the assistance provided by surface repositioning. The proposed developments in dosimetry also include an interesting reconsideration of the PTV concept with the introduction of robust photon planning (**M-C Biston**).

During this time, the imaging sessions detailed the wide field of PET techniques, with the contribution of AI for image de-noising.

The SFRO/SFPM session was dedicated to adaptive imaging with feedback from MR-Linac and Ethos users, with interesting discussions between Dutch (**E. Van Dieren**) and French practices (**D. Azria** and **O. Chapet**).

Conclave room

The 50th anniversary of the society was celebrated with the presence of almost all the successive presidents of the SFPM and **Mr. Jean-Claude Rosenwald** gave us a fascinating retrospective of radiotherapy.
It was the perfect introduction to the next day devoted to research, and particularly to the expected and ongoing upheaval in our physics profession by the introduction of artificial intelligence. A lively and exciting debate on the physicist 3.0!

As it should be at each SFPM congress, the gala evening kept all its promises: magnificent manor and park, petits fours and excellent meals...

We did not have time to dance on the bridge of Avignon, but we enjoyed weather worthy of Provence and a high quality congress. It was above all a great pleasure to see colleagues in person again, to have exchanges other than by Teams or Zoom, and to explore the industrial stands to find out the latest developments from the vendors.

To their great credit, the organization committee has made most of the conference content available here:
https://www.canalc2.tv/video/16126

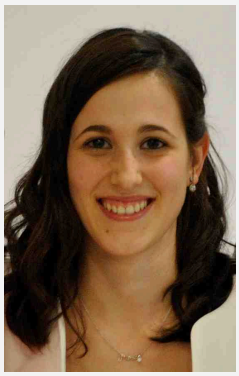
... do not hesitate!

See you next year in Nancy from June 7 to 9, 2023!

Marie Fargier-Voiron,
Clinique du Genolier

"Welcome!"

Lisa Milan



I grew up in Badia Polesine, a small town in the Veneto region of Italy, famous for its fog and nutrias! After the Bachelor's degree in Physics at the University of Ferrara, I moved to Lugano to join my husband and, given my passion for medical physics, I pursued this path at the University of Insubria, where I had the opportunity to work at the Nuclear Medicine Department of EOC for my Master's dissertation.
Afterwards, I attended the post-graduated school in Medical Physics at the University of Milan. I worked at the hospital of Varese where I dealt with the different fields of medical physics (radiotherapy, nuclear medicine, radiology and radiation protection) and also with new topics such as radiomics and machine learning.

After my specialisation, I started working at the EOC as a researcher in radiomics and predictive imaging and, after obtaining SSRMP certification, I joined the Medical Physics Service.
I am really grateful to be part of this great team, having the opportunity to grow and the freedom to experiment!

I look forward to meeting you all very soon and… join the **"MR only radiotherapy" working group**!!!!

Lisa Milan,
Ente Ospedaliero Cantonale (EOC)

"Welcome!"

Sandra Strohmeier

New dawn, new day, new life… feeling good!

Born in Madagascar and raised in France, it was in the province of Québec in Canada that I became interested in the field of medical physics during my physics study. After my Bachelor of Science in physics in the city of Trois-Rivières, I joined the medical physics research group at the *Centre Hospitalier Universitaire du Québec* for two years. As a result, I received my master diploma in medical physics from the Laval University. In 2010 I went back to Trois-Rivières and got my first job at the radiation oncology department of the *Centre Hospitalier Affilié Universitaire Régional* where I gained my major experience as a medical physicist.

After 18 winters in Canada, the wind of change took me back on the other side of the Atlantic Ocean with my family. This was the beginning of our Swiss adventure despite all the challenges it may bring with three children. In October 2021 I had the opportunity to start a temporary position as a medical physicist trainee at the *Hôpital du Valais* where I joined an amazing physics team. Five months later, I got my first swiss position as a medical physicist at the same place.

I feel that the medical physics practise is different between Quebec and Switzerland in terms of organization and regulations. However, all around the world this fantastic field undergoes the same rapid evolution due to the complexity of treatment procedures and the rise of modern technology. I am excited to develop further my knowledge with my resourceful colleagues in Sion. This year, we plan to replace one of the three linacs, and while working in the clinic I am preparing the swiss medical physics certification, another challenge to achieve.

So, moving from a country to another was not an easy decision but it's really worth it. I am grateful to work with my friendly colleagues and to live in this sunny beautiful place surrounded by mountains with which all the family fell in love. I look forward to getting to know you better during next meetings or other occasions in the future.

Sandra Strohmeier
Hôpital du Valais, Sion

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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. 104 (03/2022): 11.2022

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Conference Calendar

CALENDAR 2022

September 1
Baden
SASRO Annual Meeting
September 1 - September 3
https://www.sasro.ch/2022/

September 5
Geneva
International Conference on Occupational Radiation Protection
September 5 - September 9
https://www.iaea.org/events/occupational-radiation-protection-2022/

September 12
Bern
OFSP-BAG Workshop 2022
September 12
https://ssrpm.ch/event/ofsp-bag-workshop-2022/

September 15
Lausanne
Symposium: "Clinical translation of FLASH theapy"
September 15
https://ssrpm.ch/event/symposium-clinical-translation-of-flash-therapy/

September 21
Aachen, DE
53. Jahrestagung der DGMP
September 21 - September 24
https://www.dgmp-kongress.de/

September 28
Bern
SSRMP Continuous Education Day 2022
September 28
https://ssrpm.ch/event/ssrmp-continuous-education-day-2022/

October 15
Barcelona, ES
EANM'22
October 15 - October 19
https://eanm22.eanm.org/

October 17
Online
Kurse im Bereich "Partikeltherapie" 2022
October 17 - October 25
https://ssrpm.ch/event/spezialkurse-im-bereich-partikeltherapie-2022/

October 27
Thun
55th SSRMP Annual Meeting
October 27 - October 28
https://ssrpm.ch/event/55th-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!