

„Czech-Austrian Workshop on Magnetic Resonance Imaging and Spectroscopy 2022”
(Project number: 93p1)

Final Report

The aim of this project was to organize international workshop on Magnetic Resonance for Czech and Austrian students and research fellows with the main goal to familiarize the audience with the scientific projects and recent advances in medical research sites focused on magnetic resonance imaging and spectroscopy. These traditional workshops are organized by participating groups from Vienna and Prague since 1995. We gather the participants from Charles University in Prague, Institute for Clinical and Experimental Medicine, Medical University of Vienna, Technical University Graz, Medical University Graz, Medical University Innsbruck, Danube Private University Krems, CEITEC (the Central European Institute of Technology) and Institute of Scientific Measurement, Czech Academy of Sciences, Brno.

The workshop took place in Frein an der Mürz, Freinerhof hotel from 5th till 7th October 2022. It was attended by 55 scientists from both countries. A great mix of young scientist at all graduation levels visiting and participating at the workshop for first time up to senior scientist returning to the workshop regularly was achieved and presentations from different fields of biomedical MR research sparked lively discussion during the sessions, coffee breaks and during the free time. This year graduate or undergraduate students could present their research ideas or results of their work to international audience again (total number of presentations 33 in six scientific sessions + one keynote lecture). The complete program of the workshop with the title of presentations and list of participants is attached (Program_Aktion_2022.pdf). Students especially valued the possibility to give their talks within this motivated and friendly platform. Presentation covered most of the topics related to magnetic resonance. The focus was laid on:

- i) Brain MR imaging
- ii) Functional MR imaging and angiography MRI/MRS: Data processing
- iii) Preclinical molecular MR spectroscopy and imaging
- iv) Advances and new approaches in MR hardware and software – coil design
- v) X-nuclei MR imaging and spectroscopy
- vi) Optimization of RF pulses

The key-note of scientific part of the meeting was given by senior guest lecturer Prof. Ramona WOITEK, who is returning from her extended stay at Cambridge University (UK) to initiate the research on Medical Imaging at DPU, Krems, Austria. She has presented results of preclinical and clinical applications of novel hyperpolarized ¹³C MRI in the oncology research and diagnosis of mammary carcinoma. Second part of her lecture was devoted to the early and successful applications of Machine learning and Radiomics into clinical diagnosis of different oncologic disease. This lecture drawn special attention and intensive discussion lasted late into the evening.

The workshop further aimed at discussions and consultations of problems with MR sequences and data evaluation, design and construction of radiofrequency coils, unification of quantitative parameters (for perfusion imaging etc.) for determination of MR image quality and preparation of joint projects.

To increase the motivation and quality of presentations by junior researchers, two of them are regularly endowed by "Presentation Award". This time awards went to Vienna (Mrs. Veronika Čap, M.Sc. – title of presentation: Potential designs for a $^{31}\text{P}/^{1}\text{H}$ 7T calf coil) and Graz (Mr. Nick Scholland, M.Sc. – title of presentation: Generic model-based reconstruction for quantitative MRI). They were elected by jury composed from senior researchers from all sites.

The workshop was complemented by short hiking tours to nearby mountain and get-together for all participants in the evening of Oct 6th. Total price for accommodation of participants from Austria and Czech Republic, hire charge of conference room, sound system, data projector and accommodation and lodging was **EUR 8071,-**, which could be partly covered by the financial resources of this grant scheme. Cost of travel from the Czech Republic (**CZK 18114.45** - not all of them reported) and also from Vienna and Graz were also covered by the grant money.

In short, the Czech-Austrian workshop on magnetic resonance imaging and spectroscopy 2022 was successful and we would like to thank the Czech National Agency for International Education and Research – program AKTION Austria – Czech Republic for continuous support for the meeting.

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Attachment: Program-leaflet



AKTION 2022: During scientific session



AKTION 2022: "Presentation Award" ceremony (winners Mrs. Veronika Čap, M.Sc. and Mr. Nick Scholland, M.Sc. with bottles of wine).