1st Workshop of the SFB MR-DYNAMO

MATHEMATICAL METHODS IN MRI

May 20-22, 2026

Graz University of Technology

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LOCATION

- 20.05.2026
  HS 1 (ATK1120H)
  TU Graz / Campus Alte Technik
  Rechbauerstraße 12, 8010 Graz, Austria
- 21.-22.05.2026
  HS BMT (BMTEG138)
  TU Graz / Campus Neue Technik
  Stremayrgasse 16, 8010 Graz, Austria

Workshop locations

DEAR PARTICIPANT,

this workshop aims at bringing together applied mathematicians and MRI researchers working on the theoretical, computational, and algorithmic foundations of magnetic resonance imaging. In the spirit of the *Mathematics of Reconstruction in Dynamical and Active Models (MR-DYNAMO)* SFB, the workshop focuses on research that connects mathematical modeling, acquisition design, and image reconstruction across the full MRI pipeline.

The goal is to give you an opportunity to exchange results and ideas on topics at the interface of applied mathematics and MRI methodology and to promote the interchange between communities that often meet separately.

We wish you a fruitful and stimulating time at the workshop, and hope you will enjoy your stay in Graz! If you have any questions, please don't hesitate to contact us.

The organizing commitee

Workshop website

MR-DYNAMO website

MEALS

Coffee breaks will be served at the workshop venue. There are several options for lunch around the campus.

Lunch options

INTERNET

The internet can be accessed via WLAN through **eduroam**.

CONFERENCE EQUIPMENT

The conference room is equipped with a **beamer** and a **chalkboard**. A notebook with a pdf viewer will be provided. Please bring your presentation on a usb memory stick and transfer it before your session.

Speakers whose presentations contain animations or videos, or require a specific version of the viewer software, are strongly encouraged to use their own notebook and to test the system well in advance.

HANDS-ON MRI

The special session **Hands-on MRI** will take place on **Thursday from 13:30 to 14:30**. We will give a live demonstration of real-time cardiac MRI at the 3T MRI scanner of TU Graz, as well as imaging using a self-built portable low-field MRI scanner.

CONFERENCE DINNER

The **conference dinner** at **Das Franz** will take place on **Thursday** from **18:30** onwards. The two easiest ways to get there are:

- Take tram line 3 from Dietrichsteinplatz to Andritz, then continue by bus 53 to St. Gotthard. From there, it is a 5-minute walk.
- Take tram line 6 from Neue Technik or Dietrichsteinplatz to Graz Hauptbahnhof, then continue by bus 52 to Weinzödlbrücke. From there, it is an 8-minute walk.

Tickets for public transport will be provided at registration.

SCHEDULE | WEDNESDAY, MAY 20

8:15 – 9:00	**Registration**	(ATK1120H)	
9:00 – 9:30	**Opening**	(ATK1120H)	
9:30 – 10:30	**Plenary Talk**	(ATK1120H)	Chair: M. Uecker
9:30 – 10:30	**Moritz Zaiss**	MR-zero: How MR physicists move fast and break things	
10:30 – 11:00	**Coffee break**		
11:00 – 12:40	**Contributed Talks**	(ATK1120H)	Chair: F. Glang
11:00 – 11:25	**Kurt Majewski**	Direct signal control without Fourier coefficients	
11:25 – 11:50	**Viktoria Buchegger**	Arterial spin labeling MRI with radial sampling: end-to-end open-source sequence design and image reconstruction using BART	
11:50 – 12:15	**Daniel Mackner**	Open-source quantitative MRI: combined acquisition and reconstruction	
12:15 – 12:40	**Philip Schaten**	MRI sequences: practical aspects of system integration	
12:40 – 14:05	**Lunch break**		
14:05 – 15:45	**Contributed Talks**	(ATK1120H)	Chair: K. Bredies
14:05 – 14:30	**Barbara Kaltenbacher**	On uniqueness of coefficient identification in the Bloch-Torrey equation for MRI	
14:30 – 14:55	**Pablo Muñoz**	Operator splitting and adjoint-based L-BFGS for parameter identification in the Bloch-Torrey equation	
14:55 – 15:20	**Jyrki Jauhiainen**	Observability as a constraint qualification for a nonsmooth bilevel PDE constrained problem	
15:20 – 15:45	**Jakob Wagner**	Optimal control based estimation of blood pressure from MRI velocity data	
15:45 – 16:15	**Coffee break**		
16:15 – 17:30	**Contributed Talks**	(ATK1120H)	Chair: M. Uecker
16:15 – 16:40	**Rui Tian**	Nonlinear gradient modulations, multi-shot EPI, parallel imaging in a unified RKHS framework	
16:40 – 17:05	**Bastien Milani**	Non-standard inner products in MRI reconstruction	
17:05 – 17:30	**Xin Zhao**	Physical correctness of data consistency in state space model-based MRI reconstruction	

SCHEDULE | THURSDAY, MAY 21

9:00 – 10:00	**Plenary Talk**	(BMTEG138)	Chair: T. Pock
9:00 – 10:00	**Michael Unser**	Deep-spline neural networks for stable image reconstruction	
10:00 – 10:50	**Contributed Talks**	(BMTEG138)	Chair: T. Pock
10:00 – 10:25	**Markus Huemer**	Dynamic transitions for fast joint acquisition and reconstruction of CEST-Rex and T1	
10:25 – 10:50	**Štěpán Zapadlo**	Learning multi-pool dynamics in magnetic resonance imaging	
10:50 – 11:20	**Coffee break**		
11:20 – 12:35	**Contributed Talks**	(BMTEG138)	Chair: C. Clason
11:20 – 11:45	**Alexander Falk**	An inertial Langevin algorithm	
11:45 – 12:10	**Andreas Habring**	Preconditioned Langevin sampling for Bayesian imaging	
12:10 – 12:35	**Tina Holliber**	Fast and robust diffusion posterior sampling for MR image reconstruction using the preconditioned unadjusted Langevin algorithm	
12:35 – 13:30	**Lunch break**		
13:30 – 14:30	**Hands-on MRI**	Live demonstration of real-time cardiac MRI	
14:30 – 15:20	**Contributed Talks**	(BMTEG138)	Chair: M. Holler
14:30 – 14:55	**Kostas Papafitsoros**	Zero-shot self-supervised learning of spatio-temporally varying regularisation parameter maps for dynamic cardiac MR image reconstruction	
14:55 – 15:20	**Wenqi Huang**	Gabor primitives for accelerated cardiac cine MRI reconstruction	
15:20 – 15:50	**Coffee break**		
15:50 – 16:40	**Contributed Talks**	(BMTEG138)	Chair: R. Huber
15:50 – 16:15	**Nil Stolt-Ansó**	Geometrically-grounded 3D+time representations from sparse 2D MR views	
16:15 – 16:40	**Kathrin Lisa Kapper**	Patient-specific 3D ventricular models from cardiac cine MRI: a segmentation, registration, and volumetric modeling framework	
18:30	**Conference Dinner**	Das Franz	

SCHEDULE | FRIDAY, MAY 22

9:00 – 10:00	**Plenary Talk**	(BMTEG138)	Chair: B. Kaltenbacher
9:00 – 10:00	**Gerlind Plonka-Hoch**	The multichannel blind deconvolution problem in parallel MRI	
10:00 – 10:50	**Contributed Talks**	(BMTEG138)	Chair: B. Kaltenbacher
10:00 – 10:25	**Pierre-Antoine Comby**	MRI-NUFFT: an open-source toolbox for high-performance non-Cartesian reconstruction and trajectory design	
10:25 – 10:50	**Matthias Höfler**	Neural network-based motion-aware reconstruction of dynamic MRI data	
10:50 – 11:20	**Coffee break**		
11:20 – 12:35	**Contributed Talks**	(BMTEG138)	Chair: M. Huemer
11:20 – 11:45	**Tim Höpfner**	On the role of smoothness constraints in MR fingerprinting sequence optimization	
11:45 – 12:10	**Mohammad Golbabaee**	MRI2Qmap: multi-parametric quantitative mapping using multimodal contrast-weighted MRI denoising priors	
12:10 – 12:20	**Closing**	(BMTEG138)	

WE GRATEFULLY ACKNOWLEDGE SUPPORT FROM

Österreichischer Wissenschaftsfonds

FWF Österreichischer Wissenschaftsfonds

Österreichische Forschungsgemeinschaft

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