CRC 1173 *Wave phenomena: analysis and numerics*

Program of the fourth annual meeting

Haus der Kirche - Evangelische Akademie Baden, Bad Herrenalb, March 30th - April 3rd, 2020

Venue of the meeting

The fourth annual meeting of CRC 1173 will take place at the

Haus der Kirche – Evangelische Akademie Baden, Dobler Str. 51, 76332 Bad Herrenalb
https://www.hdk.ev-akademie-baden.de/

Bad Herrenalb is nearby Karlsruhe and can be easily reached by car or by public transport. Informations (in German) about travel to the workshop venue are available here:

https://www.hdk.ev-akademie-baden.de/html/anreise509.html

Timetables of the public transport (S1, about 3/4 hour from the main station) system can be found here:

http://en.kvv.de/

General informations

The meeting will start on Monday (March 30th) at 10 am and will end on Friday (April 3rd) after lunch. A welcome coffee is offered at 9:30 on Monday.

Accomodation for registered participants is reserved according to the replies to the participation poll. Registered participants will have full board. Breakfast is only provided for those who sleep at the Haus der Kirche. On Monday the rooms will not be ready for check-in before noon. You are kindly requested to leave your luggage in the conference room.

The conference room is equipped with a beamer, a laptop and a flipchart, but unfortunately there is no blackboard.

Agenda

There will be no parallel sessions.

Project presentations are non-technical overview talks given by the PIs: **25** min talk plus **5** min discussion (exception C4: 35 min talk plus 5 min discussion).

The annual presentations given by the doctoral researchers should focus on their own work. It is not necessary to explain what is done in other parts of the projects: **20** min talk plus **5** min discussion.

There are two poster sessions by the doctoral researchers on their work during the week. The posters will be up and available throughout the whole week though.

Two discussion rounds should give us plenty of designated time to discover and discuss collaboration opportunities between our projects.

During the members' assembly on Tuesday we are asking the postdocs and doctoral researchers to review the project webpages concerning being up-to-date, missing results, ...

For the social program on Wednesday afternoon, there will be two hikes (with different levels of difficulty). The more challenging variant goes to the hiker's inn on the "Teufelsmühle". When the weather is too bad there will be offered an indoor alternative, namely Fahrzeugmuseum Marxell (only in German).

Monday March 30th, 2020

09:30 - 10:00	Welcome coffee
10:00 - 10:30	Reception & Prelude
10:30 - 11:00	A12: Dynamics of the Gross–Pitaevskii equation (Liao, Schneider)
11:00 - 11:30	B9: Dynamical low-rank approximation for the simulation of radiation heat waves (Frank, Lubich)
11:30 - 11:55	Ceruti (B9)
12:00 - 13:00	Lunch and check-in
13:00 - 13:30	B4: Effective characterization of optical metamaterials beyond a local response (Plum, Rockstuhl)
13:30 - 14:10	C4: Modeling, design and optimization of 3D waveguides (Dörfler, Koos, Rockstuhl)
14:10 - 14:35	Molochkova (C4)
14:35 - 15:05	Coffee
15:05 - 15:35	C6: Uncertainty principles for inverse source and inverse scattering problems (Arens, Griesmaier)
15:35 - 16:00	Albicker (C6)
16:00 - 16:30	A3: Adaptive implicit space-time discretization for wave equations (Dörfler, Wieners)
16:00 - 18:00	Poster session I
18:00 - 19:00	Dinner
19:00 - 21:00	Meeting of the CRC Board

Tuesday March 31st, 2020

09:00 - 09:30	B3: Frequency combs (Jahnke, Koos, Reichel)
09:30 - 09:55	Gasmi (B3)
10:00 - 10:25	Trocha (B3)
10:30 - 11:00	Coffee
11:00 - 11:30	C5: Optimal design of chiral structures (Arens, Fernandez-Corbaton, Griesmaier, Rockstuhl)
11:30 - 11:55	Knöller (C5)
12:00 - 13:00	Lunch
13:00 - 14:30	Members' Assembly / Review of the project websites
14:30 - 15:00	Coffee
15:30 - 16:15	Good scientific practice
16:15 - 17:00	Discussion I
17:00 - 17:30	B8: Theory and numerics of the coupled Maxwell–Landau–Lifshitz–Gilbert equations (Dörfler, Feischl)
17:30 - 17:55	Bohn (B8)
18:00 - 19:00	Dinner
19:00 - 20:00	Meeting of the CRC Board

Wednesday April 1st, 2020

09:00 - 09:30	C2: Seismic imaging by full waveform inversion (Bohlen, Griesmaier, Rieder)
09:30 - 09:55	Rheinbay (C2)
10:00 - 10:30	B7: Dynamics of electro-cardiac depolarization waves (Loewe, Wieners)
10:30 - 11:00	Coffee
11:00 - 11:30	B5: Geometric wave equations (Lamm, Schörkhuber)
11:30 - 11:55	Schmid (B5)
12:00 - 13:00	Lunch
13:00 - 18:00	Leisure program / Hike
18:00 -	Barbecue dinner
19:00 - 20:00	Meeting of the CRC Board

Thursday April 2nd, 2020

09:00 - 09:30	A7: Numerical methods for highly oscillatory problems (Hochbruck, Jahnke, Lubich)
09:30 - 09:55	Dörich (A7)
10:00 - 10:30	A4: Time integration of Maxwell equations (Hochbruck, Schnaubelt)
10:30 - 11:00	Coffee
11:00 - 11:30	A5: Qualitative behavior of nonlinear Maxwell equations (Schnaubelt)
11:30 - 12:00	*A13*: *L^p theory of wave equations with low regularity coefficients* (Frey, Schnaubelt)
12:00 - 13:00	Lunch
13:00 - 13:30	A11: Electromagnetic fields interacting with quantum matter (Anapolitanos, Hundertmark)
13:30 - 14:00	A1: Large signals in nonlinear fiber optics (Hundertmark, Kunstmann)
14:00 - 14:45	Sustainable software in the CRC (Loewe)
14:45 - 15:45	Dicussion II & coffee
15:45 - 16:15	C1: Local inversion for linear seismic imaging (Kunstmann, Rieder)
16:15 - 16:45	A6: Time-periodic solutions for nonlinear Maxwell equations (Plum, Reichel)
16:45 - 18:00	Poster session II
18:00 - 19:00	Dinner
19:00 - 20:00	Meeting of the CRC Board

Friday April 3rd, 2020

09:00 - 09:30	A2: Numerical methods for wave problems with nontrivial boundary conditions (Hochbruck, Lubich)
09:30 - 09:55	Nick (A2)
10:00 - 10:30	AP2: Nonlinear Helmholtz equations and systems (Mandel)
10:30 - 11:00	Coffee
11:00 - 11:25	Schrammer (iRTG)
11:25 - 12:00	A10: Standing and moving pulses in periodic media (Reichel, Schneider)
12:00 - 13:00	Lunch
13:00 - 14:00	*Departure* / Meeting of the CRC Board

Projects of the CRC 1173

Project Area A • Mathematical Foundations

A1 Random signals in nonlinear fiber optics
(Hundertmark, Kunstmann, Weis)

A2 Numerical methods for wave problems with nontrivial boundary conditions
(Hochbruck, Lubich)

A3 Adaptive implicit space-time discretization for wave equations
(Dörfler, Wieners)

A4 Time integration of Maxwell equations
(Hochbruck, Jahnke, Schnaubelt)

A5 Qualitative behavior of nonlinear Maxwell equations
(Schnaubelt, Weis)

A6 Time-periodic solutions for nonlinear Maxwell equations
(Plum, Reichel)

A7 Numerical methods for highly oscillatory problems
(Hochbruck, Jahnke, Lubich)

A10 Standing and moving pulses in periodic media
(Reichel, Schneider)

A11 Electromagnetic fields interacting with quantum matter
(Anapolitanos, Hundertmark)

A12 Dynamics of the Gross–Pitaevskii equation
(Liao, Schneider)

A13 *L^p theory of wave equations with low regularity coefficients*
(Frey, Schnaubelt)

Project Area B • Dynamical Models

B3 Frequency combs
(Jahnke, Koos, Reichel)

B4 Effective characterization of optical metamaterials beyond a local response
(Plum, Rockstuhl)

B5 Biharmonic wave maps
(Lamm, Schnaubelt)

B7 Dynamics of electro-cardiac depolarization waves
(Dössel, Wieners)

B8 Theory and numerics of the coupled Maxwell–Landau–Lifshitz–Gilbert equations
(Dörfler, Feischl)

B9 Dynamical low-rank approximation for the simulation of radiation heat waves
(Frank, Lubich)

Project Area C • Identification and Design

C1 Local inversion for linear seismic imaging
(Kunstmann, Rieder)

C2 Seismic imaging by full waveform inversion
(Bohlen, Kirsch, Rieder, Wieners)

C4 Modeling, design and optimization of 3D waveguides
(Dörfler, Koos, Reichel, Rockstuhl)

C5 Optimal design of chiral structures
(Arens, Fernandez-Corbaton, Griesmaier, Rockstuhl)

C6 Uncertainty principles for inverse source and inverse scattering problems
(Arens, Griesmaier)

Associated projects

AP2 Nonlinear Helmholtz equations and systems
(Mandel)