



February 6 – 10 2017, Longyearbyen, Norway

The local Organizing Committee:

Petter E. Bjørstad

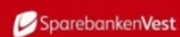
Talal Rahman

Sushmita Gupta

Liv Rebecca A. Aae



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Map of Longyearbyen



Radisson SAS Polar Hotel, Culture Centre and Coal Miners' Cabin are shown in the map.

Detailed Map of the Conference Area



- 33 Culture Centre
- 27 North Pole
- 26 Northern Light
- Polar Bear

All plenary sessions will be held in the Culture Centre/House.

International Scientific Committee

- **Bjørstad, Petter** (University of Bergen, Norway)
- **Brenner, Susanne** (Louisiana State University, USA)
- **Cai, Xiao-Chuan** (CU Boulder, USA)
- **Gander, Martin J.** (University of Geneva, Switzerland, CHAIR)
- **Halpern, Laurence** (Paris 13, France)
- **Keyes, David** (KAUST, Saudi Arabia)
- **Kim, Hyea Hyun** (Kyung Hee University, Republic of Korea)
- **Klawonn, Axel** (Universität zu Köln, Germany)
- **Kornhuber, Ralf** (Freie Universität Berlin, Germany)
- **Langer, Ulrich** (University of Linz, Austria)
- **Quarteroni, Alfio** (EPFL, Switzerland)
- **Widlund, Olof** (Courant Institute, USA)
- **Xu, Jinchao** (Penn State, USA)
- **Zou, Jun** (Chinese University of Hong Kong, Hong Kong)

Local Organizing Committee

- **Aae, Liv Rebecca** (University of Bergen, Norway)
- **Bjørstad, Petter** (University of Bergen, Norway)
- **Gupta, Sushmita** (University of Bergen, Norway)
- **Rahman, Talal** (Western Norway University of Applied Sciences, Norway)

Plenary Lectures

An additive Schwarz analysis of multiplicative Schwarz methods

Brenner, Susanne (Louisiana State University, USA)

On nonlinear adaptivity with heterogeneity

Brown, Jed (University of Colorado, USA)

Overlapping methods for high-contrast multiscale problems

Galvis, Juan (Universidad Nacional de Colombia, Colombia)

Domain Decomposition for high frequency Helmholtz problems

Graham, Ivan (University of Bath, UK)

Communication avoiding iterative solvers and preconditioners

Grigori, Laura (INRIA, France)

PDE based mesh generation: domain decomposition approaches

Haynes, Ronald (Memorial University of Newfoundland, Canada)

Robust preconditioners for coupled problems

Hu, Xiaozhe (Tufts University, USA)

Modeling and discretization of thin inclusions for flow in deformable porous media

Nordbotten, Jan (University of Bergen, Norway)

Domain decomposition based methods for multiphysics problems

Quarteroni, Alfio (EPFL, Switzerland)

Impact of high abstraction/high performance finite element software in biomedical computing

Rognes, Marie (SIMULA, Norway)

Scalable multilevel preconditioners for cardiac electro-mechanics

Scacchi, Simone (University of Milan, Italy)

Recent advances on adaptive multilevel BDDC methods for div- and curl-conforming spaces

Zampini, Stefano (KAUST, Saudi Arabia)

Minisymposia

MS01 - Achieving Robustness with New Coarse Spaces and Enlarged Krylov Subspaces

Organizers: Martin J. Gander and Nicole Spillane

MS02 - Fast Solvers for Discontinuous Galerkin Methods

Organizers: Paul Houston, Iain Smears, and Paola Antonietti

MS03 - Domain Decomposition Methods in Biomedical Modelling and Simulation

Organizers: Ralf Kornhuber, Rolf Krause, and Alfio Quarteroni

MS04 - Optimized Transmission Conditions in Domain Decomposition Methods

Organizers: Martin J. Gander and Yingxiang Xu

MS05 - Parallel Solvers for Isogeometric Analysis

Organizers: Luca F. Pavarino and Simone Scacchi

MS06 - Novel Discretizations and Solvers for High-Contrast and Multiscale Problems

Organizers: Jan Nordbotten, Eduardo Abreu, Marcus Sarkis, and Juan Galvis

MS07 - Recent Progress on Trefftz Methods

Organizer: Bruno Despres

MS08 - DD-based Control and Control-based DD

Organizers: Alfio Quarteroni, Paola Gervasio, and Marco Discacciati

MS09 - Parallel approaches for PDE based mesh generation

Organizer: Ronald D. Haynes

MS10 - Domain Decomposition for Frequency Domain Wave Problems

Organizers: Victorita Dolean and Ivan Graham

MS11 - Domain Decomposition Methods for Optimal Control and PDE Constrained Optimization

Organizers: Martin J. Gander, Felix Kwok, and Julien Salomon

MS12 - Robust Solvers for Multiphysics Problems

Organizers: Xiaozhe Hu, Shuonan Wu, and Jinchao Xu

MS13 - Domain Decomposition Methods for Nonlinear Problems

Organizers: Xiao-Chuan Cai, Leszek Marcinkowski, and Talal Rahman

MS14 - Highly Parallel Domain Decomposition Methods and their Applications

Organizers: Axel Klawonn and Oliver Rheinbach

MS15 - Heterogeneous Domain Decomposition Methods

Organizers: Martin J. Gander and Marco Discacciati

MS16 - Nonsmooth and Nonlinear Problems

Organizer: Carsten Gräser and Oliver Sander

MS17 - Time-Parallel Time Integration Methods

Organizers: Martin J. Gander and Rolf Krause

MS18 - Fast Solvers for Space-Time Discretizations

Organizers: Ulrich Langer and Olaf Steinbach

MS19 - Space-Time Parallel Methods based on Waveform Relaxation Techniques

Organizers: Martin J. Gander and Shu-Lin Wu

Contributed Talks

An iterative domain decomposition method for eddy current problems with consideration for the gauge condition

Daisuke Tagami

An optimised domain decomposition method for large scale eigenvalue problems taking advantage of a contour integral approach

Nicolas Marsic

CFD Codes on multicore and manycore architectures

David Keyes

Parallelisation and scalability of a linear advection diffusion code

Emanuele Ragnoli

Multigrid methods for $H(\text{div})$ with nonoverlapping domain decomposition smoothers

Duk-Soon Oh

A three-level BDDC method for incompressible Navier-Stokes equations

Martin Hanek

Solving large sparse linear systems with a variable s-step GMRES preconditioned by DD

Jocelyne Erhel

Design of small coarse spaces for two level overlapping Schwarz algorithms for problems with irregular subdomains

Olof B. Widlund

Non-local transmission operators for non-overlapping DDM with exponential convergence for Helmholtz equation

Matthieu Lecouvez

Acceleration Techniques for Multilevel FETI Methods

Lubomir Riha

An efficient and reliable stopping criterion for the solution of symmetric saddle point problems with FETI

Ange B. Toulougoussou

Scalable TFETI based domain decomposition for contact problems with variationally consistent discretization of non-penetration

Zdeněk Dostál

Spectral properties of the FETI constraint matrices based on graph theory

Václav Hapla

Poster Session

Implementation of handling multiple subdomains per one computational core into PERMON toolbox to exploit fully TFETI numerical scalability

Radim Sojka

Asynchronous optimized Schwarz method for Poisson equation on rectangular domains

Jose C. Garay

A dual iterative substructuring method with a modified penalty term to decouple the inner problems

Jongho Park

A fast iterative method for multigroup radiation diffusion problems

Jose Pablo Lucero Lorca

Multigrid method for a staggered discontinuous Galerkin approximation

Lina Zhao

Overview of Schedule

Monday, February 6th 2017

	Culture Centre	North Pole	Northern Light	Polar Bear
08:00	Breakfast served			
09:30	Bus departs from Coal Miners' Cabin			
10:00	Welcome/Opening			
10:30	PL01 Ivan Graham			Culture Centre
11:15	PL02 Jan Nordbotten			Culture Centre
12:00	Lunch at Radisson			
13:30	MS06: 1-4	MS10: 1-4	MS14: 1-4	MS17: 1-4
15:10	Coffee at Culture Centre and Radisson			
15:40	MS06: 5-8	MS10: 5-8	MS14: 5-8	MS17: 5-8
17:20	Moving/Stretching legs			
17:30	PL03 Ronald Haynes			Culture Centre
18:15	PL04 Juan Galvis			Culture Centre
19:00	End of Talks			
19:10	Bus departs for Coal Miners' Cabin			

Tuesday, February 7th 2017

	Culture Centre	North Pole	Northern Light	Polar Bear
07:00	Breakfast served			
08:10	Bus departs Coal Miners' Cabin			
08:30	PL05 Alfio Quarteroni			Culture Centre
09:15	PL06 Marie Rognes			Culture Centre
10:00	Coffee at Culture Centre and Radisson & Introduction to Poster session			
10:30	MS06: 9-11	MS13: 1-4	MS02: 1-4	CT01: 1-4
12:10	Lunch at Radisson			
13:40	PL07 Xiaozhe Hu			Culture Centre
14:25	Moving/Stretching legs			
14:35	MS12: 1-4	MS13: 5-8	MS02: 5-7	MS15: 1-4

16:15	Coffee at Culture Centre and Radisson			
16:45	MS03: 1-5	MS09: 1-5	CT02: 1-5	MS15: 5-8
18:50	End of talks			
19:00	Bus departs for Coal Miners' Cabin			
19:15	DDM Business meeting at Hjalmar Johansen			
21:00	DDM Dinner with invited speakers at Spitsbergen Hotel 20:45 Bus from Radisson			

Wednesday, February 8th 2017

	Culture Centre	North Pole	Northern Light	Polar Bear
06:00	Breakfast served			
07:10	Bus departs from Coal Miners' Cabin			
07:30	PL08 Susanne Brenner			Culture Centre
08:15	Moving/Stretching legs			
08:25	MS12: 5-8	MS11: 1-4	MS19: 1-4	MS07: 1-4
10:05	Coffee at Culture Centre and Radisson			
10:35	MS12: 9-11	MS11: 5-7	MS19: 5-7	MS07: 5-7
11:50	Lunch at Radisson			
	Excursion			

Thursday, February 9th 2017

	Culture Centre	North Pole	Northern Light	Polar Bear
07:00	Breakfast served			
08:10	Bus departs from Coal Miners' Cabin			
08:30	PL09 Simone Scacchi			Culture Centre
09:15	PL10 Jed Brown			Culture Centre
10:00	Coffee at Culture Centre and Radisson			
10:30	MS01: 1-4	MS04: 1-4	MS05: 1-4	MS18: 1-4
12:10	Lunch at Radisson			
13:40	PL11 Stefano Zampini			Culture Centre
14:25	Moving/Stretching legs			
14:35	MS01: 5-8	MS04: 5 MS16: 1	MS05: 5-7	CT03: 1-4
16:15	Coffee at Culture Centre and Radisson			

16:45	MS01: 9-12	MS16: 2-5	MS08: 1-4	
18:50	End of talks			
19:00	Bus departs for Coal Miners' Cabin			
20:00	Conference Banquet 19:45 Bus from Radisson & Coal Miners' Cabin. Attention! Warm clothes			

Friday, February 10th 2017

	Culture Centre	North Pole	Northern Light	Polar Bear
07:00	Breakfast served			
08:40	Bus departs from Coal Miners' Cabin Attention Coal Miners! Check out before boarding the bus, take your luggage with you			
09:00	PL12 Laura Grigori			Culture Centre
09:45	Conference closing remarks at Culture Centre			
11:00	Check out from hotels			
	Bus to airport from Radisson: 11:20 (Norwegian) 12:00 (SAS)			

Monday, February 6th 2017

	Culture Centre	North Pole	Northern Light	Polar Bear
08:00	Breakfast served			
09:30	Bus departs from Coal Miners' Cabin			
10:00	Welcome/Opening			
10:30	PL01 Ivan Graham			Culture Centre
11:15	PL02 Jan Nordbotten			Culture Centre
12:00	Lunch at Radisson			
13:30	MS06: 1-4	MS10: 1-4	MS14: 1-4	MS17: 1-4
15:10	Coffee at Culture Centre and Radisson			
15:40	MS06: 5-8	MS10: 5:8	MS14: 5-8	MS17: 5-8
17:20	Moving/Stretching legs			
17:30	PL03 Ronald Haynes			Culture Centre
18:15	PL04 Juan Galvis			Culture Centre
19:00	End of Talks			
19:10	Bus departs for Coal Miners' Cabin			

10:00~10:30 Opening Ceremony

Chair: Martin J. Gander

10:30~11:15 PL01 Ivan Graham Culture Centre

Domain Decomposition for high frequency Helmholtz problems

Ivan Graham

10:30~11:15 PL02 Jan Nordbotten Culture Centre

Modelling and discretization of thin inclusions for flow in deformable porous media

Jan Nordbotten

Chair: MS-organizer

13:30~15:10 MS06-1 Novel Discretizations and Solvers for High-Contrast and Multiscale Problems Culture Centre

Overlapping Schwarz with a spectrally enriched coarse space in 3D

Leszek Marcinkowski, Erik Eikeland, Talal Rahman*

Primal hybrid discretizations based on BDDC and adaptive selection of primal constraints, and on localized orthogonal decomposition method

Marcus Sarkis, Alexandre Madureira*

OS-ACMS: Multiscale coarse spaces for overlapping Schwarz method based on the ACMS space in two dimensions

Alexander Heinlein, Axel Klawonn, Jascha Knepper, Oliver Rheinbach*

Degenerate approximation of Green's function in the presence of high-contrast

*Mario Bebendorf**

Chair: MS-organizer

13:30~15:10	MS10-1 Domain decomposition for frequency domain wave problems	North Pole
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A numerical study on the compressibility of Schur complements of discretized Helmholtz equations

*Martin J. Gander**

A two-level preconditioner for the Maxwell's equations in conductive media

Marcella Bonazzoli, Victorita Dolean, Ivan Graham, Euan Spence*

What is the minimal shift to use in the shifted Helmholtz preconditioner for its effective inversion by multigrid?

Pierre-Henri Cocquet, Martin J. Gander*

Two-level preconditioners for the Helmholtz equation

Marcella Bonazzoli, Victorita Dolean, Pierre-Henri Tournier*

Chair: MS-organizer

13:30~15:10	MS14-1 Highly parallel domain decomposition methods and their applications	Northern Light
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FE2TI - An extremely scalable computational homogenization approach

*Axel Klawonn, Martin Lanser, Oliver Rheinbach**

Nonlinear BDDC

Axel Klawonn, Martin Lanser, Oliver Rheinbach*

An advanced OO software framework for the development of MLBDDC preconditioners

Santiago Badia, Alberto F. Martín*

Scalability study of overlapping schwarz for 3d unstructured meshes

*Xiao-Chuan Cai**

Chair: MS-organizer

13:30~15:10	MS17-1 Time-parallel time integration methods	Polar Bear
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SpaceTime multigrid methods for parabolic problems^{SEP}

*Martin Neunmüller**

Time parallelization of waveform relaxation methods

*Felix Kwok**

A multigrid perspective on the parallel full approximation scheme in space and time

*Matthias Bolten**

Parallel in time methods based on PFASST for PDE constrained optimal control problems

Michael Minion, Sebastian Götschel*

Coffee Break at Radisson and Culture Centre

Chair: MS-organizer

15:40~17:20	MS06-2 Novel discretizations and solvers for high-contrast and multiscale problems	Culture Centre
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A multiscale model reduction method for nonlinear monotone elliptic equations in heterogeneous media

Eric T. Chung, Yalchin Efendiev, Ke Shi, Shuai Ye*

An adaptive GMsFEM for high-contrast flow problems

Guanglian Li, Eric T. Chung, Yalchin Efendiev*

Nonoverlapping additive Schwarz for hp-DGFEM with discontinuous coefficients

*Piotr Krzyzanowski**

Finite volume discretizations of poro-elasticity in high-contrast media

Eirik Keilegavlen, Eren Ucar, Jan Nordbotten, Inga Berre*

Chair: MS-organizer

15:40~17:20	MS10-2 Domain decomposition for frequency domain wave problems	North Pole
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New stability results for the Helmholtz equation with variable coefficients

Ivan G. Graham, S. A. Sauter*

Block-Jacobi multi-trace formulations and optimized Schwarz methods

Xavier Claeys, Victorita Dolean, Martin J. Gander, Pierre Marchand*

Non-overlapping Schwarz domain decomposition methods with Padé-localized transmission operators for time-harmonic acoustic, electromagnetic and elastodynamic waves

Vanessa Mattesi, Christophe Geuzaine*

Domain substructuring using IGA and FEM with application to radio frequency cavity simulation

J. Corno, A. Buffa, C. de Falco, S. Schps, R. Vazquez*

Chair: MS-organizer

15:40~17:20

MS14-2 Highly parallel domain decomposition methods and their applications

Northern Light

Projector-less highly scalable variant of the TFETI method implemented in the PERMON toolbox

David Horak, Zdeněk Dostál, Václav Hapla, Radim Sojka, Jakub Kruzik*

Advanced technics for designing scalable multilevel preconditioners

*Pierre Jolivet**

Lean and mean: Finite elements solvers beyond a trillion degrees of freedom

*Ulrich Rüde**

Combining adaptive mesh refinement with a parallel multilevel BDDC solver

Jakub Šístek, Pavel Kůs*

Chair: MS-organizer

15:40~17:20

MS17-2 Time-parallel time integration methods

Polar Bear

An iterative approach for time-parallel time integration based on discontinuous Galerkin methods

Xiaozhou Li, Pietro Benedusi, Rolf Krause*

Lossy compression of finite element coefficients for reducing communication in time-parallel simulations

Sebastian Götschel, Martin Weiser, Lisa Fischer, Thomas Steinke, Florian Wende, Alexander Kammeyer*

Matching algorithms and their use in time-parallel molecular dynamics simulations

*Frederic Legoll, Tony Lelièvre, Keith Myerscough, Giovanni Samaey**

On scalable space-time balancing domain-decomposition solvers

*Santiago Badia, Marc Olm**

Chair: Susanne Brenner

17:30~18:15

PL03 Ronald Haynes

Culture Centre

PDE based mesh generation: domain decomposition approaches

Ronald Haynes

18:15~19:00

PL04 Juan Galvis

Culture Centre

Overlapping methods for high-contrast multiscale problems

Juan Galvis

Tuesday, February 7th 2017

	Culture Centre	North Pole	Northern Light	Polar Bear
07:00	Breakfast served			
08:10	Bus departs from Coal Miners' Cabin			
08:30	PL05 Alfio Quarteroni			Culture Centre
09:15	PL06 Marie Rognes			Culture Centre
10:00	Coffee at Culture Centre and Radisson & Introduction to Poster session			
10:30	MS06: 9-11	MS13: 1-4	MS02: 1-4	CT01: 1-4
12:10	Lunch at Radisson			
13:40	PL07 Xiaozhe Hu			Culture Centre
14:25	Moving/Stretching legs			
14:35	MS12: 1-4	MS13: 5-8	MS02: 5-6	MS15: 1-4
16:15	Coffee at Culture Centre and Radisson			
16:45	MS03: 1-5	MS09: 1-5	CT02: 1-5	MS15: 5-8
18:50	End of talks			
19:00	Bus departs for Coal Miners' Cabin			
19:15	DDM Business meeting at Hjalmar Johansen			
21:00	DDM Dinner with invited speakers at Spitsbergen Hotel 20:45 Bus from Radisson			

Chair: Olof Widlund

8:30~9:15	PL05 Alfio Quarteroni	Culture Centre
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Domain decomposition based methods for multiphysics problems

Alfio Quarteroni

09:15~10:00	PL06 Marie Rognes	Culture Centre
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Impact of high abstraction/high performance finite element software in biomedical computing

Marie Rognes

Coffee Break at Radisson and Culture Centre
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Chair: MS-organizer

10:30~12:10	MS06-3 Novel discretizations and solvers for high-contrast and multiscale problems	Culture Centre
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MsFEM accelerated topology optimization of linear elastic and heat transfer systems

*Boyan S. Lazarov**

Robust discretization of flow in fractured porous media

Wietse Boon, Jan Nordbotten, Ivan Yotov*

Conservative properties of high-order finite element approximations

Juan Galvis, Marcus Sarkis, Eduardo Abreu, Ciro Diaz*

Chair: MS-organizer

10:30~12:10	MS13-1 Domain decomposition methods for nonlinear problems	North Pole
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Nonlinear FETI-DP methods for nonlinear problems

Axel Klawonn, Martin Lanser, Oliver Rheinbach, Matthias Uran*

Additive and restricted additive Schwarz methods for quasilinear inequalities

*Lori Badea**

Domain decomposition methods for a class of non-smooth and non-additive convex variational problems

*Andreas Langer**

Nonlinear field-split preconditioners and applications

*Lulu Liu**

Chair: MS-organizer

10:30~12:10	MS02-1 Fast solvers for discontinuous Galerkin methods	Northern Light
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Adaptive aggregations on graphs and applications

*Ludmil Zikatanov**

Auxiliary space preconditioners for discontinuous Galerkin discretizations of $H(\text{curl})$ -elliptic problems with discontinuous coefficients

Blanca Ayuso de Dios, Ralf Hiptmair, Cecilia Pagliantini*

A nonoverlapping DD preconditioner for heterogeneous elliptic problems

Susanne Brenner, Eun-Hee Park, Li-yeng Sung*

Robust and efficient preconditioners for the discontinuous Galerkin time-stepping method

*Iain Smears**

Chair: Ulrich Langer

10:30~12:10

Contributed Talks Session 1: Domain decomposition algorithms and applications

Polar Bear

An iterative domain decomposition method for eddy current problems with consideration for the gauge condition

Daisuke Tagami, Shin-Ichiro Sugimoto*

An optimised domain decomposition method for large scale eigenvalue problems taking advantage of a contour integral approach

Nicolas Marsic, Christophe Geuzaine, Felix Wolf, Sebastian Schöps, Herbert De Gersem*

CFD codes on multicore and manycore architectures

David Keyes, Bilel Hadri, Alexander Heinecke, Maxwell Hutchinson, Matteo Parsani*

Parallelisation and scalability of a linear advection diffusion code

Emanuele Ragnoli, Fearghal O'Donncha*

Chair: Jinchao Xu

13:40~14:25

PL07 Xiaozhe Hu

Culture Centre

Robust preconditioners for coupled problems

Xiaozhe Hu

Chair: MS-organizer

14:35~16:15

MS12-1 Robust solvers for multiphysics problems

Culture Centre

Towards scalable and efficient solution of full Maxwell electromagnetics – multifluid plasma systems

John N. Shadid, Edward G. Phillips, Eric C. Cyr, Roger P. Pawlowskii, Sean A. Miller*

A mixed-method b-field finite-element formulation for incompressible, resistive magnetohydrodynamics

*James Adler **

Iterative methods for nonlinear discrete MHD systems

*Kaibo Hu**

A conforming enriched finite element method for elliptic interface problems

*Hua Wang, Jinru Chen**

Chair: MS-organizer

14:35~16:15	MS13-2 Domain decomposition methods for nonlinear problems	North Pole
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Domain decomposition method for two-phase flow model using global Jacobian

Kundan Kumar, Benjamin Ganis, Gergina Pencheva, Mary F. Wheeler, Ivan Yotov*

Robust iteration for nonlinear flows in highly heterogeneous media

*Juan Galvis**

Linear and nonlinear domain decomposition techniques for the steady-state resolution of electroelastoacoustic problems

Alexandre Halbach, Christophe Geuzaine*

Scalable domain decomposition preconditioners for cardiac electro-mechanical models

Luca F. Pavarino, P. Colli Franzone, S. Scacchi, and S. Zampini*

Chair: MS-organizer

14:35~16:15	MS02-2 Fast solvers for discontinuous Galerkin methods	Northern Light
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Agglomeration based h-multigrid solution strategies for dG discretizations of the incompressible Navier-Stokes equation

Francesco Bassi, Lorenzo Botti, Alessandro Colombo*

Nonoverlapping Schwarz preconditioners for high-order DG methods: optimal bounds

Paola F. Antonietti (given by Iain Smears)

Advances in hybrid discontinuous Galerkin methods

*Eun-Jae Park**

Chair: MS-organizer

14:35~16:15	MS15-1 Heterogeneous domain decomposition methods	Polar Bear
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Domain decomposition partition of unity methods

Gabriele Ciaramella, Martin J. Gander*

Optimized Schwarz methods in the Stokes-Darcy coupling

Luca Gerardo-Giorda, Marco Discacciati*

Optimized Schwarz methods for heterogeneous problems

Tommaso Vanzan, Martin J. Gander*

Heterogeneous domain decomposition

Martin J. Gander, Laurence Halpern, Véronique Martin^{[1][2]}_{SEP}*

Coffee Break at Radisson and Culture Centre

Chair: MS-organizer

16:45~18:50

MS03 Domain decomposition methods in biomedical modelling and simulation

Culture Centre

A heterogeneous finite element joint model to support orthopaedic hip surgery planning

*Ralf Kornhuber, Oliver Sander, Jonathan Youett**

Coupling eikonal and monodomain equations

Martin Weiser, Adrian Sali*

A parallel solver for electromechanical simulations of ventricular hypertrophy

*P. Colli Franzone, F. Del Bianco, L. Fassina, L. F. Pavarino, S. Zampini, S. Scacchi**

Simulating wear on total knee replacements

Ansgar Burchardt, Oliver Sander*

A fictitious domain method for fluid-structure interaction based on the pseudo – L^2 – projection between non conforming overlapping meshes

Maria Nestola, Patrick Zulian, Alena Kopanicakova, Cyrill VonPlanta., Rolf Krause*

Chair: MS-organizer

16:45~18:50

MS09 Parallel approaches for PDE based mesh generation

North Pole

A parallel moving mesh method based on optimal transport

*Emily Walsh**

Space-time adaptive meshing with the XBraid library

Jacob B. Schroder, Robert D. Falgout, Ben O'Neill, Thomas A. Manteuffel*

Optimally-transported meshes for global weather prediction

Andrew McRae, Colin J. Cotter, Christopher J. Budd*

Towards a parallel-in-time multigrid solver for fluid-structure interaction problems in real-world applications

Andreas Hessesenthaler, Robert D. Falgout, Jacob B. Schroder, David A. Nordslettern, and Oliver Röhrle*

Probabilistic domain decomposition for parallel mesh generation

Alexander Bihlo, Ronald D. Haynes, Leah Genge*

Chair: Jun Zou

16:45~18:50	Contributed Talks Session 2: Domain decomposition algorithms and applications	Northern Light
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Design of small coarse spaces for two level overlapping Schwarz algorithms for problems with irregular subdomains

*Clark Dohrmann, Olof Widlund**

Multigrid methods for $H(\text{div})$ with nonoverlapping domain decomposition smoothers

*Duk-Soon Oh**

A three-level BDDC method for incompressible Navier-Stokes equations

*Martin Hanek**

Solving large sparse linear systems with a variable s-step GMRES preconditioned by DD

*David Imberti and Jocelyne Erhel**

Non-local transmission operators for non-overlapping DDM with exponential convergence for Helmholtz equation

M. Lecouvez, P. Joly, F. Collino, B. Stupfel*

Chair: MS-organizer

16:45~18:50	MS15-2 Heterogeneous domain decomposition methods	North Pole
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INTERNODES: An interpolation-based approach for the numerical solution of PDEs on nonconforming discretizations

Paola Gervasio, Simone Deparis, Davide Forti, Alfio Quarteroni*

Embedded boundary methods and domain decomposition

Santiago Badia, Francesc Verdugo*

Reduced representation of the Steklov-Poincaré operator for coupled multi-physics systems

Matteo Aletti, Damiano Lombardi*

Multipatch discontinuous Galerkin isogeometric analysis on non-matching domain decompositions

Christoph Hofer, Ulrich Langer, Ioannis Touloupoulos*

Wednesday, February 8th 2017

	Culture Centre	North Pole	Northern Light	Polar Bear
06:00	Breakfast served			
07:10	Bus departs from Coal Miners' Cabin			
07:30	PL08 Susanne Brenner Culture Centre			
08:15	Stretch your legs			
08:25	MS12: 5-8	MS11: 1-4	MS19: 1-4	MS07: 1-4
10:05	Coffee at Culture Centre and Radisson			
10:35	MS12: 9-11	MS11: 5-7	MS19: 5-7	MS07: 5-7
11:50	Lunch at Radisson			
	Excursion			

Chair: Hyea Hyun Kim

07:30~08:15	PL08 Susanne Brenner	Culture Centre
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An additive Schwarz analysis of multiplicative Schwarz methods

Susanne Brenner

Chair: MS-organizer

08:25~10:05	MS12-2: Robust solvers for multiphysics problems	Culture Centre
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A parallel-in-time algorithm for variable stepsize multistep methods

M. Lecouvez, R. D. Falgout, C. S. Woodward*

Abstract multigrid method

*Jinchao Xu**

An unified approach to the design and analysis of AMG

Jinchao Xu, Hongxuan Zhang, Ludmil Zikatanov*

Multigrid method for a class of new mixed discretization of linear elasticity

Shihua Gong, Shuonan Wu, Jinchao Xu*

Chair: MS-organizer

08:25~10:05	MS11-1: Domain decomposition methods for optimal control and PDE-constrained optimization	North Pole
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A parareal method for optimality systems in control

Julien Salomon, Felix Kwok, Martin J. Gander*

Preconditioners for time-dependent PDE-constrained optimization based on parareal time-domain decomposition

*Stefan Ulbrich**

An optimized domain decomposition method for optimal control problems

Bérangère Delourme, Laurence Halpern*

Parallel D-D type domain decomposition algorithm for optimal control problem governed by parabolic partial differential equation

Bo Zhang, Jixin Chen, Danping Yang*

Chair: MS-organizer

08:25~10:05	MS19-1 Space-time parallel methods based on waveform relaxation techniques	Northern Light
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Best approximation problem and application to Schwarz waveform relaxation

*Laurence Halpern**

Experiments on the space-time FETI method

*Hui Zhang**

Optimization of overlapping waveform relaxation methods for RC circuits

Pratik M. Kumbhar, Martin J. Gander*

Pipeline implementations of Dirichlet-Neumann and Neumann-Neumann waveform relaxation methods

*Bankim Chandra Mandal**

Chair: MS-organizer

08:25~10:05	MS07-1 Recent progress on Trefftz methods	Polar Bear
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The Trefftz-UWVF method for Friedrichs systems with relaxation

Bruno Després, Christophe Buet, Guillaume Morel*

Variable coefficients and Trefftz methods

*Lise-Marie Imbert-Gérard**

Space-time Trefftz discontinuous Galerkin methods for wave problems

*Andrea Moiola**

An enriched discontinuous Galerkin method for the time-harmonic eddy current problem

*Raffael Casagrande**

Coffee Break at Radisson and Culture Centre

Chair: MS-organizer

10:35~11:15 MS12-3 Robust solvers for multiphysics problems

Culture Centre

A segregated Uzawa smoother in multigrid for poroelastic problems

*Francisco Gaspar**

Monolithic multigrid method for the coupled Darcy-Stokes problem

*F.J. Gaspar, P. Luo, C.W. Oosterlee, C. Rodrigo**

Optimal multigrid methods for $H(\text{div})$ -conforming discontinuous Galerkin discretizations of the Brinkman problem

*J. Kraus**

Chair: MS-organizer

10:35~11:15 MS11-2 Domain decomposition methods for optimal control and PDE-constrained optimization

North Pole

A generalized Suzuki–Trotter type method in optimal control of coupled Schrödinger equations

*Manfred Liebmann**

Preconditioners for edge element systems arising from various Maxwell equations

*Jun Zou**

Preconditioning time-dependent PDE-constrained optimization problems

*John Pearson**

Chair: MS-organizer

10:35~11:15 MS19-2 Space-time parallel methods based on waveform relaxation techniques

Northern Light

Functional iterations with Laplace inversion for DLCPs

*Shu-Lin Wu**

Parareal Dirichlet-Neumann and parareal Neumann-Neumann waveform relaxation for the heat equation

Bo Song, Yaolin Jiang*

Space-time domain decomposition methods and a posteriori error estimates for the subsurface

Sarah Ali Hassan, Caroline Japhet, Michel Kern, Martin Vohralík (given by Iain Smears)

Chair: MS-organizer

10:35~11:15 MS07-2 Recent progress on Trefftz methods

Polar Bear

Gaussian beam approximations

*Olof Runborg**

Adaptive refinement for hp-version Trefftz discontinuous Galerkin methods for the homogeneous Helmholtz problem

Scott Congreve, Paul Houston, Ilaria Perugia*

Trefftz-UWVF discretization of transport equations with physical absorption

Guillaume Morel, Bruno Després, Christophe Buet*

Thursday, February 9th 2017

	Culture Centre	North Pole	Northern Light	Polar Bear
07:00	Breakfast is served			
08:10	Bus departs from Coal Miners' Cabin			
08:30	PL09 Simone Scacchi			Culture Centre
09:15	PL10 Jed Brown			Culture Centre
10:00	Coffee at Culture Centre and Radisson			
10:30	MS01: 1-4	MS04: 1-4	MS05: 1-4	MS18: 1-4
12:10	Lunch at Radisson			
13:40	PL11 Stefano Zampini			Culture Centre
14:25	Moving/Stretching legs			
14:35	MS01: 5-8	MS04: 5 MS16: 1	MS05: 5-7	CT03: 1-4
16:15	Coffee at Culture Centre and Radisson			
16:45	MS01: 9-12	MS16: 2-5	MS08: 1-4	
18:50	End of talks			
19:00	Bus departs for Coal Miners' Cabin			
20:00	Conference Banquet 19:45 Bus from Radisson & Coal Miners' Cabin. Attention! Warm clothes			

Chair: Xiao-Chuan Cai

08:30~09:15	PL09 Simone Scacchi	Culture Centre
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Scalable multilevel preconditioners for cardiac electro-mechanics

Simone Scacchi

09:15~10:00	PL10 Jed Brown	Culture Centre
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On nonlinear adaptivity with heterogeneity

Jed Brown

Coffee Break at Radisson and Culture Centre
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Chair: MS-organizer

10:30~12:10

MS01-1 Achieving robustness with new coarse spaces and enlarged Krylov subspaces

Culture Centre

Optimal coarse spaces and their approximation

*Martin J. Gander**

A new coarse space for Neumann-Neumann method

*Martin J. Gander, Kevin Santugini-Répiquet, Faycal Chaouqui**

Robust coarse spaces for abstract Schwarz preconditioners via generalized eigenproblems.

*Emmanuel Agullo, Luc Giraud, Louis Poirel**

SHEM: An optimal coarse space for RAS and its multiscale approximation

*Martin J. Gander, Atle Loneland**

Chair: MS-organizer

10:30~12:10

MS04-1 Optimized transmission conditions in domain decomposition methods

North Pole

Optimized iterative mesh tying

Hui Zhang, Yingxiang Xu*

Optimized Schwarz method for different geometric interface configurations

C. Vergara, G. Gigante^{TT}_{SEP}*

Optimized Schwarz methods for the optimal control of systems governed by elliptic partial differential equations

Yingxiang Xu and Xin Chen*

A double source transfer domain decomposition method for Helmholtz equations in unbounded domain

*Xueshuang Xiang**

Chair: MS-organizer

10:30~12:10

MS05-1 Parallel solvers for isogeometric analysis

Northern Light

Symbol-based multigrid methods for isogeometric analysis

M. Donatelli, C. Garoni, C. Manni, S. Serra-Capizzano, H. Speleers*

Single and multi-patch iterative solvers for isogeometric analysis

*Giancarlo Sangalli, Mattia Tani**

New robust and efficient multigrid methods for isogeometric analysis

*C. Hofreither**

Multigrid solvers for isogeometric discretizations of the Stokes problem

*S. Takacs**

Chair: MS-organizer

10:30~12:10	MS18-1 Fast solvers for space-time discretizations	Polar Bear
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Parallel space–time multigrid for the time–periodic Navier–Stokes equations

Pietro Benedusi, Daniel Hupp, Peter Arbenz, Rolf Krause*

Space–time isogeometric analysis of parabolic evolution problems

*Ulrich Langer, Stephen E. Moore, Martin Neumüller**

Preconditioned space–time boundary element methods for the heat equation

Stefan Dohr, Olaf Steinbach*

Space-time finite and boundary element methods for the heat equation

*Olaf Steinbach**

Chair: David Keyes

13:40~14:25	PL11 Stefano Zampini	Culture Centre
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Recent advances on adaptive multilevel BDDC methods for div- and curl-conforming

Stefano Zampini

Chair: MS-organizer

14:35~16:15	MS01-2 Achieving robustness with new coarse spaces and enlarged Krylov subspaces	Culture Centre
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Adaptive BDDC/FETI-DP algorithms

*Eric Chung, Junxian Wang, Hyea Hyun Kim**

FETI-DP and BDDC for composite materials - adaptive coarse spaces in 3D

Axel Klawonn, Martin Kühn, Oliver Rheinbach*

Robust domain decomposition methods in industrial context applied to large business cases

Augustin Parret-Fréaud, Christian Rey, Frédéric Feyel, Christophe Bovet, Pierre Gosselet, Basile Marchand, Nicole Spillane*

Robustness assessment and new clustering techniques for the adaptive multi-preconditioned FETI method

Christophe Bovet, Pierre Gosselet, Augustin Parret-Fréaud, Nicole Spillane*

Chair: MS-organizer

14:35~16:15 MS04-2 Optimized transmission conditions in domain decomposition methods

North Pole

Optimized double sweep Schwarz method by complete radiation boundary conditions for the Helmholtz equation

Seungil Kim, Hui Zhang*

Recent progress in domain decomposition methods for the Helmholtz equation

*Christiaan C. Stolk**

Recursive and additive sweeping preconditioners for the Helmholtz equation

Fei Liu, Lexing Ying*

Chair: MS-organizer

14:35~16:15 MS05-2 Parallel solvers for isogeometric analysis

Northern Light

Isogeometric FETI-DP methods for incompressible Stokes equations

*A. Cortes, L. Dalcin, A. Sarmiento Rodriguez, S. Zampini**

Exact and inexact IETI-DP solvers for continuous and discontinuous Galerkin IgA Equations

Christoph Hofer, Ulrich Langer*

Isogeometric BDDC and FETI-DP preconditioners for linear elasticity

L. F. Pavarino, S. Scacchi, O. B. Widlund, S. Zampini*

Chair: Laurence Halpern

14:35~16:15 Contributed Talks Session 3: FETI Domain decomposition

Polar Bear

Acceleration techniques for multilevel FETI methods

Lubomir Riha, Alexandros Markopoulos, Ondrej Meca, Tomas Brzobohaty, Tomas Kozubek*

An efficient and reliable stopping criterion for the solution of symmetric saddle point problems with FETI

Ange B. Toulougoussou, Pierre Gosselet, Francois-Xavier Roux*

Scalable TFETI based domain decomposition for contact problems with variationally consistent discretization of non-penetration

Zdeněk Dostál, Oldrich Vlach*

Spectral properties of the FETI constraint matrices based on graph theory

*Václav Hapla**

Chair: MS-organizer

16:45~18:50

MS01-3 Achieving robustness with new coarse spaces and enlarged Krylov subspaces

Culture Centre

New coarse space components for additive Schwarz

*Martin J. Gander, Bo Song**

Asynchronous optimized Schwarz, theory and experiments

Frédéric Magoulés, Daniel B. Szyld, Cedric Venet*

Adaptive enlarged Krylov conjugate gradient

*Laura Grigori, Olivier Tissot**

Adaptive multipreconditioning for symmetric and non-symmetric problems

*Christophe Bovet, Pierre Gosselet, Nicole Spillane**

Chair: MS-organizer

15:50~18:50

MS16 Nonsmooth and nonlinear problems

North Pole

An efficient numerical treatment of a fractured, elastic medium with contact constraints

Jakub W. Both, Oliver Sander*

Coffee Break at Radisson and Culture Centre

On the globally convergent solution of large deformation contact problems

*Ralf Kornhuber, Oliver Sander, Jonathan Youett**

Non-overlapping domain decomposition methods for the minimization of the dual total variation

*Andreas Langer**

Nonlinearly preconditioned inexact Newton methods for nonsmooth optimization

*Carsten Gräser**

Nonsmooth multigrid for small-strain plasticity problems

*Oliver Sander**

Chair: MS-organizer

16:45~18:50 MS08 DD-based control and control-based DD

Northern Light

Control and coupling strategies for nonlinear domain-decomposition methods

Rolf Krause, Patrick Zulian, Alena Kopanicakova, Christian Groß*

Interface control domain decomposition (ICDD) method to couple Navier-Stokes and Darcy equations

Paola Gervasio, Marco Discacciati, Alfio Quarteroni*

Optimization-based approach for problems with non-conforming interface discretizations

Paul Kuberry, Pavel Bochev, Kara Peterson*

Robust preconditioners for optimality systems - an infinite-dimensional perspective

Jarle Sogn, Walter Zulehner*

Friday, February 10th 2017

	Culture Centre	North Pole	Northern Light	Polar Bear
07:00	Breakfast is served			
08:40	Bus departs from Coal Miners' Cabin Attention Coal Miners! Check out before boarding bus, take your luggage with you			
09:00	PL12 Laura Grigori			Culture Centre
09:45	Conference closing remarks			
11:00	Check out from hotels			
	Bus to airport from Radisson: 11:20 (Norwegian) 12:00 (SAS)			

Chair: Ralf Kornhuber

09:00~09:45 PL12 Laura Grigori Culture Centre

Communication avoiding iterative solvers and preconditioners

Laura Grigori