

# Waves 2009

Pau, 15-19 June 2009

## Local Information and Programme

1. **Registration and main conference desk.** The registration desk will be open on Sunday from 16.00 to 18.00 and for large parts of each day throughout the conference, especially in lunchtime and break periods. Please ask at the conference desk if you have any queries or need any assistance.
2. **Lectures.** All lectures take place in the Palais Beaumont, the plenary lectures in Auditorium Alfred de Vigny, and the contributed lectures in Auditorium Alfred de Vigny and in rooms Montpezat, Alphand, Gabard, Lautréamont and Nerval.  
Half an hour is allocated to each contributed lecture, to include questions, so that speakers should aim to stop within 25 minutes. Chairs of sessions are asked to rigorously enforce a half hour cut-off to discussion to allow interchange between the parallel sessions.  
If using computer projection in your talk you are advised to either test your laptop beforehand with the computer projector or to upload your pdf or powerpoint file onto the computer in the room that you are speaking in earlier in the day of your lecture.
3. **Coffee Breaks.** Coffee breaks will all be taken in room Henri Faisans at the times shown in the programme.
4. **Lunches.** Lunches will be taken in “Salle des Ambassadeurs”.
5. **The excursions.** Coaches will leave from Palais Beaumont on Wednesday at 14.00 and will drive you back either to the town center or the Palais Beaumont after the cheese and wine tasting. Participants to rafting are asked to bring swimsuit, towel and additional basket shoes. Showers will be available after the rafting. Participants to hiking in the Pyrénées and in the Jurançon are asked to bring comfortable shoes. Participants to hiking in the Pyrénées are also advised to bring a windbreaker such as a Kway.
6. **Conference dinner.** Coaches will leave from Palais Beaumont on Thursday at 19.00 and will drive you back either to the town center or the Palais Beaumont after the dinner.
7. **Computing facilities.** Wifi is available in all the Palais Beaumont without any code. There will also be a (small) computer room in Palais Beaumont.
8. **Luggage Storage.** On your day of departure your luggage can be stored in the room behind the reception desk.

<b>Monday</b>					
8h00-8h45	Registration				
8h45-9h00	Opening				
9h00-10h00	<b>Invited Lecture</b> : Maarten de Hoop Wave-Ray Duality, and a Multi-scale Approach to Wave Propagation and Imaging Chair : Olivier Lafitte				
10h00-10h30	Coffee Break in room Henri Faisans				
	Auditorium Alfred de Vigny	Room Montpezat	Room Alphand	Room Gabard	Room Lautréamont
10h30-12h30	<b>Mini-symposium</b> Numerical Simulation of Time Dependent Waves in Unbounded Domain organized by Thomas Hagstrom and Marcus Grote	Inverse Problems (I) Chair : Marc Bonnet	Discontinuous Galerkin Methods and Domain Decomposition (I) Chair : Peter Monk	Wave Guides (I) Chair : Anne-Sophie Bonnet-Ben Dhia	Electromagnetism (I) Chair : Patrick Lacoste
12h30-14h00	Lunch in "Salle des ambassadeurs"				
14h00-15h00	<b>Invited Lecture</b> : Ralf Hiptmair Regularized Combined Field Integral Equations Chair : Sébastien Tordeux				
15h00-16h30	High Performance Computing (I) Chair : Jean Roman	High Order Methods (I) Chair : Manfred Kaltenbacher	Nonlinear Waves (I) Chair : Olivier Lafitte	Asymptotic Models (I) Chair : Patrick Joly	Wave Guides (II) Chair : Christophe Hazard
16h30-17h00	Coffee Break in room Henri Faisans				
17h00-18h30	High Performance Computing (II) Chair : Jean Roman	High Order Methods (II) Chair : Manfred Kaltenbacher	Wave Guides (III) Chair : Christophe Hazard	Asymptotic Models (II) Chair : Patrick Joly	
18h30	Cocktail in room Henri Faisans				

## Monday, June 15

**8h00–8h45**

Registration of the Participants

**8h45–9h00**

**Auditorium Alfred de Vigny:** Opening of Waves 2009

**9h00–10h00**

**Auditorium Alfred de Vigny: Invited Lecture. Maarten de Hoop, Purdue University, USA**  
Wave-Ray Duality, and a Multi-scale Approach to Wave Propagation and Imaging  
Chair : Olivier Lafitte

**10h30–12h30**

**Auditorium Alfred de Vigny: Minisymposium Numerical Simulation of Time Dependent Waves in Unbounded Domains** organized by Thomas Hagstrom and Marcus Grote (I).

10h30–11h00 Wave Representations and Complete Radiation Boundary Conditions

*Thomas Hagstrom*

11h00–11h30 High-Order Absorbing Boundaries: Recent Extensions and Improvements

*Dan Givoli, Thomas Hagstrom, Eliane Bécache, Assaf Mar-Or*

11h30–12h00 A High-Order Super-Grid-Scale Absorbing Layer and Its Application to Linear Hyperbolic Systems

*Daniel Appelo, Tim Colonius*

12h00–12h30 Numerical Simulation of Schrodinger's Equation with Variable Potential Functions

*Chunxiong Zheng*

**Room Montpezat: Session Inverse Problems (I).** Chair: Marc Bonnet

10h30–11h00 Inverse Scattering at a Fixed Energy

*Ricardo Weder*

11h00–11h30 An Inverse Problem Based on the Wave Equation: Numerical Localization of Imperfections of Small Volume.

*Marion Darbas, Mark Asch, Jean-Baptiste Duval*

11h30–12h00 An Iterative Time Reversal Algorithm for Initial Data Inverse Problems for Conservative Systems

*Karim Ramdani, Marius Tucsnak, Kazufumi Ito*

12h00–12h30 An Application of the Factorization Method to the Detection of Inclusions in Acoustics

*Yann Grisel, Pierre-Alain Mazet, Vincent Mouysset*

**Room Alphan: Session Discontinuous Galerkin Methods and Domain Decomposition (I).**  
Chair: Peter Monk

10h30–11h00 A Domain Decomposition Method for Helmholtz Problems Discretized using the Discontinuous Enrichment Method

*Charbel Farhat, Radek Tezaur, Jari Toivanen*

11h00–11h30 A New Discontinuous Galerkin Solution Methodology for Helmholtz Problems

*Magdalena Grigoroscuta, Mohamed Amara, Rabia Djellouli*

11h30–12h00 Developments of the Wave-Based Discontinuous Galerkin Methods

*Gwenael Gabard, Greg Kennedy*

12h00–12h30 Interior Penalty Discontinuous Galerkin Method for Maxwell's Equations in Dispersive Media

*Jichun Li, Yunqing Huang*

**Room Gabard: Session Wave Guides (I).** Chair: Anne-Sophie Bonnet-Ben Dhia

10h30–11h00 A Modal Radiation Condition for Scattering in Open Waveguides

*Anne-Sophie Bonnet-Ben Dhia, Lahcène Chorfi, Ghania Dakhia, Christophe Hazard*

11h00–11h30 Modelling of Elastic Wave Propagation in Prestressed Helical Waveguides

*Frikha Ahmed, Fabien Treysede, Patrice Cartraud*

11h30–12h00 TE Mode Propagation in Curved Multimode Waveguides

*Emmanuel Perrey-Debain, I. David Abrahams*

12h00–12h30 Modelling of TE and TM Modes in Photonic Crystal Wave-Guides

*Kersten Schmidt, Roman Kappeler***Room Lautréamont: Session Electromagnetism (I).** Chair: Patrick Lacoste

10h30–11h00 Stochastic Processes Induced by Electromagnetic Waves With White Noise Initial Values

*Bas Michielsen*

11h00–11h30 Summation Rules and Physical Bounds for Partial Wave Scattering in Electromagnetics

*Anders Bernland, Mats Gustafsson, Sven Nordebo*

11h30–12h00 Convergence Analysis of a Finite Volume Method Solving Bidimensional Maxwell's Equations on Arbitrary Meshes

*Siham Layouni, Pascal Omnes*

12h00–12h30 Numerical Properties of Constraint-Preserving Boundary Conditions for a Second Order Wave Equation

*Alexander Alekseenko***14h00–15h00****Auditorium Alfred de Vigny: Invited Lecture. Ralf Hiptmair, ETH Zürich, Switzerland.  
Regularized Combined Field Integral Equations**

Chair: Sébastien Tordeux

**15h00–16h30****Auditorium Alfred de Vigny: Session High Performance Computing (I).** Chair: Jean Roman

15h00–15h30 High-Frequency Simulations of Seismic Wave Propagation in the Whole Earth on 150,000 Processor Cores of a Petaflop Machine

*Dimitri Komatitsch, Laura Carrington, Michael Laurenzano, Mustafa Tikir, David Michéa, Nicolas Le Goff, Allan Snavely, Jeroen Tromp*

15h30–16h00 Algebraic Multigrid Acceleration of Iterative Solution of the Discretised Vector Wave Equation with Application to Cavity Scattering

*Duncan van der Heul, Shiraz Abdoel, Kees Vuik, Harmen van der Ven*

16h00–16h30 RTM on Cell/B.E. Architectures

*Jose M. Cela***Room Montpezat: Session High Order Methods (I).** Chair: Manfred Kaltenbacher

15h00–15h30 A Compact Fourth-Order-Accurate Embedded Boundary Method for the Wave Equation

*Daniel Appelo, Anders Petersson*

15h30–16h00 High-Order Method in Space and Time for Solving the Wave Equation

*Cyril Agut, Julien Diaz, Abdelaziz Ezziani*

16h00–16h30 Highly Accurate Schemes for Wave Propagation Systems: Application in Aeroacoustics

*Nathalie Bartoli, Vincent Mouyset, Pierre-Alain Mazet, François Rogier***Room Alphan: Session Nonlinear Waves (I).** Chair: Olivier Lafitte

15h00–15h30 Inverse Spectral Problems and Initial-Boundary Value Problems for Nonlinear Wave Equations

*Alexander Sakhnovich*

15h30–16h00 Scattering From a Cylindrical Cavity in a Pre-Stressed, Nonlinear Elastic Medium

*William J. Parnell, I. David Abrahams*

16h00–16h30 Mathematic Analysis of the KZK Equation

*Anna Rozanova-Pierrat*

**Room Gabard: Session Asymptotic Models (I).** Chair: Patrick Joly

15h00–15h30 Decay of Solutions for Solutions to Viscous Asymptotical Models for Water Waves

*Min Chen, Serge Dumont, Louis Dupaigne, Olivier Goubet*

15h30–16h00 Skin-Effect Description in Electromagnetism with a Scaled Asymptotic Expansion

*Victor Péron, Gabriel Caloz, Monique Dauge*

16h00–16h30 Uniform Asymptotic Expansions of Multiple Scattering Iterations

*Fatih Ecevit, Fernando Reitich*

**Room Lautréamont: Session Wave Guides (II).** Chair: Christophe Hazard

15h00–15h30 Preconditioning for Nanoelectronic Devices

*Hong Guo, Nilima Nigam, Olga Trichtchenko*

15h30–16h00 Wave Computation on the Hyperbolic Double Doughnut

*Agnes Bachelot*

16h00–16h30 A New Approach to Weinstein-Type Diffraction Problems

*Andrey Shanin*

### 17h00–18h30

**Auditorium Alfred de Vigny: Session High Performance Computing (II).** Chair: Jean Roman

17h00–17h30 Seismic Wave Modeling by a Chebyshev Multi-domain Block Decomposition Method: a Massive Parallel Tool for 3D large scale simulations

*Geza Seriani, Peter Danecek*

17h30–18h00 Parallel Methods for Time-Dependent Linear Wave Problems

*Lehel Banjai, Daniel Peterseim*

18h00–18h30 On the Use of a Parallel Algebraic Hybrid Linear Solver for Frequency Domain Acoustic Wave Modeling

*L. Giraud, A. Haidar, S. Operto, F. Sourbier, J. Virieux*

**Room Montpezat: Session High Order Methods (II).** Chair: Manfred Kaltenbacher

17h00–17h30 Fast High-Order Finite Elements for the Integral Equations of Time-Harmonic Maxwell Problems

*Edouard Demaldent, Gary Cohen, David Levadoux*

17h30–18h00 Convolution Quadrature Applied to Time Domain Electromagnetic Scattering

*Qiang Chen, Peter Monk, Daniel Weile, Xiaobao Wang*

18h00–18h30 A High-Precision, Explicit and Compact Scheme Without Order Depending CFL Values.

*Sophie Laurens, Pierre-Alain Mazet*

**Room Alphanand: Session Wave Guides (III).** Chair: Christophe Hazard

17h00–17h30 Mode Matching Method for Cylindrical Dissipative Silencers with Poroelastic Material

*Benoit Nennig, Emmanuel Perrey-Debain, Mabrouk Ben Tahar*

17h30–18h00 On the Existence and Uniqueness of Electromagnetic Guided Modes

*Carlos Jerez-Hanckes, Jean-Claude Nédélec*

18h00–18h30 Resonant Transparency of Multi-Layer Structures with Opaque Materials  
*Andrei Smolyakov, Natalia Sternberg, Fourkal Fourkal*

**Room Gabard: Session Asymptotic Models (II).** Chair: Patrick Joly

17h00–17h30 Matching of Asymptotic Expansions for a 2-D Eigenvalue Problem with two Cavities Linked by a Narrow Hole  
*Sebastien Tordeux, Abdelkader Tizaoui*

17h30–18h00 An Optimal Design Problem for the Scattering Resonances of Subwavelength Open Cavity  
*E. Bonnetier, Faouzi Triki*

18h00–18h30 Matched Asymptotics in Small Inclusion Problems for a Class of Inhomogeneous Operators  
*Xavier Claeys*

<b>Tuesday</b>					
9h00-10h00	<b>Invited Lecture</b> : Abderrahmane Bendali Recent Developments in the Scattering of an Electromagnetic Wave by a Coated Perfectly Conducting Obstacle Chair : H��l��ne Barucq				
10h00-10h30					
	Auditorium Alfred de Vigny	Room Montpezat	Room Alphand	Room Gabard	Room Lautr��amont
10h30-12h30	Mini-symposium Numerical Simulation of Time Dependent Waves in Unbounded Domain organized by Thomas Hagstrom and Marcus Grote	Inverse Problems (II) Chair : Housseem Haddar	High Order Methods (III) Chair : Julien Diaz	Electromagnetism (II) Chair : David Levadoux	Elastic Waves (II) Chair : Roland Martin
12h30-14h00	Lunch in "Salle des ambassadeurs"				
14h00-15h00	<b>Invited Lecture</b> : Luis Vega Non-Linear Schr��dinger Equations and Vortex Dynamics Chair : Alain Bachelot				
15h00-17h00	<b>Minisymposium</b> Fast solvers for high frequency problems organized by Oscar Bruno	Inverse Problems (III) Chair : Fioralba Cakoni	Nonlinear Waves (III) Chair : David Abrahams	Absorbing Boundary Conditions (I) Chair : Eli Turkel	Discontinuous Galerkin Methods and Domain Decomposition (II) Chair : Jeronimo Rodriguez
17h00-17h30	Coffee Break in room Henri Faisans				

## Tuesday, June 16

9h00–10h00

**Auditorium Alfred de Vigny: Invited Lecture. Abderrahmane Bendali, Toulouse Mathematics Institute, France.**

Recent Developments in the Scattering of an Electromagnetic Wave by a Coated Perfectly Conducting Obstacle  
Chair: H el ene Barucq

10h30–12h30

**Auditorium Alfred de Vigny: Minisymposium Numerical Simulation of Time Dependent Waves in Unbounded Domains** organized by Thomas Hagstrom and Marcus Grote (I).

10h30–11h00 On Local Nonreflecting Boundary Conditions for Time-Dependent Multiple Scattering  
*Marcus Grote, Imbo Sim*

11h00–11h30 Transparent Boundary Conditions Based on the Pole Condition  
*Achim Schaedle, Daniel Ruprecht, Frank Schmidt*

11h30–12h00 Efficient Solution of the Wave Equation in Unbounded Domains  
*Stefan Sauter*

**Room Montpezat: Session Inverse Problems (II).** Chair: Housseem Haddar

10h30–11h00 An Inverse Fluid-Solid Interaction Problem  
*Peter Monk, Virginia Selgas*

11h00–11h30 Transmission Eigenvalues and Nondestructive Testing  
*Fioralba Cakoni, David Colton, Housseem Haddar*

11h30–12h00 The Linear Sampling Method Explained by Energy Conservation  
*Riccardo Aramini, Manuel Benedetti, Giacomo Caviglia, Luca Manica, Andrea Massa, Michele Piana*

12h00–12h30 Mathematical Analysis of the D.O.R.T. Method for Electromagnetic Closed Time Reversal Mirrors  
*Karim Ramdani, Bertrand Thierry, Xavier Antoine, Bruno Pin on*

**Room Alphan : Session High Order Methods (III).** Chair: Julien Diaz

10h30–11h00 Higher Order Finite Element Methods for Acoustic Field Problems in the Time Domain  
*Andreas H uppe, Manfred Kaltenbacher*

11h00–11h30 Very High Order Transport Schemes for Multid Wave Simulation  
*Bruno Despres*

11h30–12h00 Multi-Wavelength Sized Finite Elements for Helmholtz Wave Problems  
*M. S. Mohamed, A. El Kacim, Omar Laghrouche*

12h00–12h30 Excitation–adaptive FDTD Scheme Design by the Method of Undetermined Coefficients for Specified Spectral Orders of Accuracy  
*Bezalel Finkelstein, Raphael Kastner*

**Room Gabard: Session Electromagnetism (II).** Chair: David Levadoux

10h30–11h00 A Hybrid Patch Method to Solve a 1d Maxwell Problem  
*Laura Pebernet, Xavier Ferrieres, Fran ois Rogier, Pierre Degond*

11h00–11h30 Continuous Mixed Spectral Finite Elements for the Maxwell Eigenproblem  
*Gary Cohen, Alexandre Sinding*



11h30–12h00 A Physically-based Preconditioner for 2D Electromagnetic Rough Surfaces Scattering Problems

*Simon Tournier, Pierre Borderies, Jean-René Poirier*

12h00–12h30 Numerical Analysis of the Generalised Maxwell Equations and Charged Particle Simulations

*Patrick Ciarlet, Simon Labrunie*

**Room Lautréamont: Session Elastic Waves (I).** Chair: Roland Martin

10h30–11h00 Localized Waves in Thin Elastic Plate with Loaded Edges

*Ivan Andronov*

11h00–11h30 A New Fast BEM for 3-D Multi-Domain Elastic Wave Propagation Problems

*Stéphanie Chaillat, Jean-François Semblat, Marc Bonnet*

11h30–12h00 Uniqueness for the Outgoing Elastic Wave in a Half-Plane with Free Boundary

*Ignacio Muga, Mario Duran, Jean-Claude Nédélec*

**14h00–15h00**

**Auditorium Alfred de Vigny: Invited Lecture. Luis Vega, University of the Basque Country, Spain.**

Non-Linear Schrödinger Equations and Vortex Dynamics

Chair: Alain Bachelot

**15h00–17h00**

**Auditorium Alfred de Vigny: Minisymposium Fast Solvers for High Frequency Problems** organized by Oscar Bruno (I).

15h00–15h30 Development of the Ultra Weak Variational Formulation

*Tommi Huttunen, Teemu Luostari, Peter Monk*

15h30–16h00 High-Order Integral Equation Methods for Diffraction Problems on Screens

*Oscar Bruno, Stéphane Lintner*

16h00–16h30 Well-Conditioned Source Integral Equation for the Transmission Problems in Electromagnetism

*David Levadoux, Sébastien Pernet*

16h30–17h00 Integral Equation Methods for the Helmholtz Problem With a Random Impedance Condition

*Roman Gagnaire, Christophe Geuzaine*

**Room Montpezat: Session Inverse Problems (III).** Chair: Fioralba Cakoni

15h00–15h30 Applications of No-Sampling Linear Sampling to 3D Inverse Scattering Problems

*Massimo Brignone, Riccardo Aramini, Giovanni Bozza, Michele Piana*

15h30–16h00 Non-Iterative Defect Identification by Topological Sensitivity Method

*Cedric Bellis, Marc Bonnet, Bojan Guzina*

16h00–16h30 On the Determination of the Boundary Impedance from the Far Field Pattern

*Yuri Godin, Boris Vainberg*

**Room Alphanf: Session Nonlinear Waves (III).** Chair: David Abrahams

15h00–15h30 Coupled Mode Equations for Gap Solitons in the 2D Periodic Nonlinear Schrödinger Equation

*Tomas Dohnal, Hannes Uecker*

15h30–16h00 Signal Analysis by Expansion Over the Squared Eigenfunctions of an Associated Schrödinger Operator

*Taous Meriem Laleg-Kirati, Emmanuelle Crépeau, Michel Sorine*

16h00–16h30 Energy Preserving Scheme for Non Linear Systems of Wave Equations. Application to Piano

Strings.

*Juliette Chabassier, Patrick Joly*

**Room Gabard: Session Absorbing Boundary Conditions (I).** Chair: Eli Turkel

15h00–15h30 Absorbing boundary conditions for Schrödinger equations with potentials and nonlinearities  
*Xavier Antoine, Christophe Besse, Pauline Klein*

15h30–16h00 IPDG Formulation of the Acoustic Wave Equation Incorporating a BGT-like Boundary Condition

*Hélène Barucq, Julien Diaz, Véronique Duprat*

16h00–16h30 Generalized Impedance Boundary Conditions for Rough Surface Scattering

*Armin Lechleiter, Housseem Haddar*

16h30–17h00 Analytical Study in the High-Frequency Regime of the Performance of Local Approximate DtN Boundary Conditions for Prolate Spheroidal-Shaped Boundaries

*Hélène Barucq, Rabia Djellouli, Anne-Gaëlle Saint-Guirons*

**Room Lautréamont: Session Discontinuous Galerkin Methods and Decomposition Domains (II).** Chair: Jerónimo Rodríguez

15h00–15h30 Discontinuous Galerkin Method for Solving the 3D Acoustic Wave Equation

*Timo Lähivaara, Tomi Huttunen*

15h30–16h00 Application of Discontinuous Galerkin Method on Hexahedral Elements for the Aeroacoustic Equation

*Gary Cohen, Marc Duruflé*

16h00–16h30 Discontinuous Galerkin Goal Oriented hp-Adaptivity for Time Dependant Friedrich Systems.

*Vincent Mouysset*

16h30–17h00 Non-Matching Grids for a Flexible Discretization in Computational Acoustics

*Manfred Kaltenbacher, Simon Triebenbacher, Bernd Flemisch, Barbara Wohlmuth*

<b>Wednesday</b>					
9h00-10h00	<b>Invited Lecture</b> : Laurence Halpern Optimized Schwarz Waveform Relaxation and Wave Equations Chair : Abderrahmane Bendali				
10h00-10h30	Coffee Break in room Henri Faisans				
	Auditorium Alfred de Vigny	Room Montpezat	Room Alphan	Room Gabard	Room Lautréamont
10h30-12h30	<b>Minisymposium</b> Fast solvers for high frequency problems organized by Oscar Bruno	Inverse Problems (IV) Chair : Ricardo Weder	Nonlinear Waves (IV) Chair : Luis Vega	Perfectly Matched Layers (I) Chair : Eliane Bécache	Scattering Problems (I) Chair :
12h30-14h00	Lunch in "Salle des ambassadeurs"				
14h00-18h00	<b>Hiking or Rafting</b>				
18h00-20h00	<b>Wine-tasting session in the Jurançon vineyard</b>				

## Wednesday, June 17

**9h00–10h00**

**Auditorium Alfred de Vigny: Invited Lecture. Laurence Halpern, Université Paris 13, France.**  
 Optimized Schwarz Waveform Relaxation and Wave Equations  
 Chair : Abderrahmane Bendali

**10h30–12h30**

**Auditorium Alfred de Vigny: Minisymposium Fast Solvers for High Frequency Problems** organized by Oscar Bruno (II).

10h30–11h00 Theory and Implementation of Robust Methods for High-Frequency Acoustic Wave Scattering

*Victor Dominguez, Ivan Graham, Tatiana Kim*

11h00–11h30 Efficient Numerical Evaluation of Scattering Coefficients for Arbitrarily Shaped Perfectly Conducting Cones

*V. Smyshlyaev, B. Samokish*

11h30–12h00 High Frequency BEMs for Scattering by Non-Convex Obstacles: a Model Problem

*Simon Neil Chandler-Wilde, Stephen Langdon, A. Twigger*

12h00–12h30 Fast, High-Order, Well-Conditioned Algorithms for the Solution of Three-Dimensional Acoustic and Electromagnetic Scattering Problems

*Catalin Turc, Oscar Bruno, Tim Elling*

**Room Montpezat: Session Inverse Problems (IV)** Chair: Ricardo Weder.

10h30–11h00 A Newton Method for the Reconstruction of Complex Permittivity of an Inhomogeneous Material Located in a Rectangular Waveguide

*Emre Kilic, Duygu Merve Ozaltin, Funda Akleman, Ali Yapar, Özgür Özdemir*

11h00–11h30 Applications of the Fisher Information Integral Operator for Inverse Problems

*Sven Nordebo, Andreas Fhager, Mats Gustafsson, Börje Nilsson*

11h30–12h00 Simultaneous Scatterer Shape Estimation and Far-Field Pattern Denoising

*Yaakov Olshansky, Inna Stainvas, Eli Turkel*

12h00–12h30 Deconstructing the Sun: Computational Tomography of the Solar Interior

*Shravan Hanasoge, Laurent Gizon*

**Room Alphan: Session Nonlinear Waves (IV).** Chair: Luis Vega

10h30–11h00 Tralling Wave Solutions for the Nerve Influx Equations

*Olivier Lafitte*

11h00–11h30 Dispersive Energy Balance for Undular Bores

*Alfatih Ali, Henrik Kalisch*

11h30–12h00 Recovery-Based Mesh Adaptivity for Shallow Water Problems

*Giovanni Porta, Simona Perotto, Francesco Ballio*

12h00–12h30 Well-Balanced Positivity Preserving Central-Upwind Scheme on Triangular Grids for the Saint-Venant System

*Steve Bryson, Yekaterina Epshteyn, Alexander Kurganov, Guergana Petrova*

**Room Gabard: Session Perfectly Matched Layers (I)** Chair: Eliane Bécache.

10h30–11h00 Stable Perfectly Matched Layer for Short Water Waves

*Hélène Barucq, Julien Diaz, Mounir Tlemcani*

11h00–11h30 Perfectly Matched Layers for Star-Shaped Domains.

*Sophie Laurens, Pierre-Alain Mazet*

11h30–12h00 A Stable Perfectly Matched Layer for the Anisotropic Elastic Wave Equations in Second Order Formulation

*Kenneth Duru, Gunilla Kreiss*

12h00–12h30 Mixed Spectral Finite Elements and PML for the Cauchy-Poisson Problem

*Gary Cohen, Sébastien Imperiale*

**Room Lautréamont: Session Scattering Problems (I):** Chair: .

10h30–11h00 Numerical Study of a Spectral Approach to Solve Integral Equation Formulation of the Acoustic Multiple Scattering Problem by Disks.

*Xavier Antoine, Karim Ramdani, Bertrand Thierry*

11h00–11h30 Scattering Calculations using the Potential Method

*Magnus Herberthson*

11h30–12h00 Time-Harmonic Acoustic Scattering in a Complex Flow: A Full Coupling Between Acoustics and Hydrodynamics

*Anne-Sophie Bonnet-Ben Dhia, Jean-François Mercier, Florence Millot, Sébastien Pernet*

12h00–12h30 Parameter Dependence of Resonances in Quantum Mechanical Scattering

*Przemyslaw Klosiewicz, Wim Vanroose, Jan Broeckhove*

Thursday						
9h00-10h00	<p align="center"><b>Invited Lecture</b> : Jeroen Tromp            Seismic Modeling and Imaging Based Upon Spectral-Element and Adjoint Methods            Chair : Dimitri Komatitsch</p>					
10h00-10h30	Coffee Break in room Henri Faisans					
	Auditorium Vigny	Room Montpezat	Room Alphan	Room Gabard	Room Lautréamont	Room Nerval
10h30-12h30	<p><b>Minisymposium</b>            High-order methods for the solution of wave propagation PDE models organized by Stéphane Lanteri</p>	<p>Inverse Problems (V)            Chair : Rabia Djellouli</p>	<p>Seismic Waves (I)            Chair : Jeroen Tromp</p>	<p>Scattering Problems (II)            Chair : Jean-François Mercier</p>	<p>Periodic and Random Media (I)            Chair : Paul Martin</p>	<p>Perfectly Matched Layers (II)            Chair : Daniel Appelo</p>
12h30-14h00	Lunch in "Salle des ambassadeurs"					
14h00-15h00	<p align="center"><b>Invited Lecture</b> : Jan Hesthaven            Reduced Basis Methods for Electromagnetics            Chair : Gary Cohen</p>					
15h00-16h30	<p>High Performance Computing (III)            Chair : Wim Vanroose</p>	<p>High-Frequency Wave Propagation (I)            Chair : Isabelle Terrasse</p>	<p>Discontinuous Galerkin Methods and Domain Decomposition (III)            Chair : Xavier Juvigny</p>	<p>Periodic and Random Media (II)            Chair : Liliana Borcea</p>	<p>Asymptotic Models (III)            Chair : Clair Poinard</p>	<p>Perfectly Matched Layers (III)            Chair : Dimitri Komatitsch</p>
16h30-17h00	Coffee Break in room Henri Faisans					
17h00-19h00	<p><b>Minisymposium</b>            High-order methods for the solution of wave propagation PDE models organized by Stéphane Lanteri</p>	<p>Integral Equations (I)            Chair : Eric Darrigrand</p>	<p>Seismic Waves (II)            Chair : Abdelaaziz Ezziani</p>	<p>Absorbing Boundary Conditions (II)            Chair : Dan Givoli</p>	<p>Asymptotic Models (IV)            Chair : Bing Tie</p>	<p>Elastic Waves (II)            Chair : Ignacio Muga</p>
19h00--	Conference Dinner in Jaï Alai					

## Thursday, June 18

9h00–10h00

**Auditorium Alfred de Vigny: Invited Lecture. Jeroen Tromp, Princeton University USA.**  
Seismic Modeling and Imaging Based Upon Spectral-Element and Adjoint Methods  
Chair: Dimitri Komatitsch

10h30–12h30

**Auditorium Alfred de Vigny: Minisymposium High-Order Methods for the Solution of Wave Propagation PDE Models With Applications to Electromagnetics and Geoseismics** organized by Stéphane Lanteri (I).

10h30–11h00 Exact Charge Conservation in a High-Order Conforming Maxwell Solver coupled with Particles

*Martin Campos Pinto, Sébastien Jund, Guillaume Latu, Stéphanie Salmon, Eric Sonnendrucker*

11h00–11h30 Explicit Local Time-Stepping for Transient Electromagnetic Waves

*Marcus Grote, Teodora Mitkova*

11h30–12h00 Some Techniques for an Efficient Use of a Discontinuous Galerkin Approximation of Time Domain Maxwell's Equations on Hexahedral Meshes

*Sébastien Pernet, Xavier Ferrieres, Laura Pebernet, Bernard Pecqueur*

12h00–12h30 Overcoming Performance Bottlenecks in DG-FEM for EM Problems

*Sehun Chun, Housseem Haddar, Jan Hesthaven, Andreas Klöckner, Tim Warburton, Lucas Wilcox*

**Room Montpezat: Session Inverse Problems (V).** Chair: Rabia Djellouli

10h30–11h00 Noncontact Diagnostics of Elastic Materials by Inverse Methods of Nonlinear Acoustics

*Oleg Alifanov, Alexander Korobov, Kirill Nenarokomov*

11h00–11h30 An Efficient Multi-Step Procedure for Enriching Limited Two-Dimensional Far-Field Pattern Measurements

*Chokri Bekkey, Rabia Djellouli, Hélène Barucq*

11h30–12h00 On the Small-Defect Perturbation and Sampling of Heterogeneous Solids Using Viscoelastic Waves

*Bojan Guzina, Huina Yuang*

**Room Alphan: Session Seismic Waves (I).** Chair: Jeroen Tromp

10h30–11h00 True Amplitude Prestack Reverse-Time Migration: Mathematical Theory

*Chris Stolk, Tim Op 't Root, Maarten de Hoop*

11h00–11h30 Imaging With Multiply Scattered Seismic Waves

*Alison Malcolm, Bjorn Ursin, Maarten de Hoop*

11h30–12h00 Three-Dimensional Parallel Finite-Difference Modeling of Seismic Wave Propagation on Multicore Architectures: Application to the Nice, France, Urban Area

*Fabrice Dupros, Ariane Ducellier, Hideo Aochi, Dimitri Komatitsch, Jean Roman*

12h00–12h30 3D Wave-Packet Transform for Geometric Representation of Seismic Data

*Anton Duchkov, Fredrik Andersson, Maarten de Hoop*

**Room Gabard: Session Scattering Problems (II)** Chair Jean-François Mercier.

10h30–11h00 Scattering Representations of Dynamic Fields: Implications for Green's Function Retrieval

*Ivan Vasconcelos, Evert Slob, Roel Snieder, Kees Wapenaar, Deyan Draganov*

11h00–11h30 On the Kleinman-Martin Integral Equation Method for the Electromagnetic Scattering Problem by a Dielectric

*Frederique Le Louer, Martin Costabel*

11h30–12h00 Analysis of a Class of Cylindrical Multi-conductor Scatterers Using Method of Regularisation

*Kaiser Lock, Paul Smith, Elena Vinogradova*

**Room Lautréamont: Session Periodic and Random Media (I).** Chair: Paul Martin

10h30–11h00 Filtering Random Media Effects in Imaging

*Liliana Borcea, Fernando Gonzales del Cueto, George Papanicolaou, Chrysoula Tsogka*

11h00–11h30 High Order Asymptotic Expansion for the Scattering of Fast Oscillating Periodic Surfaces

*Jean-René Poirier, Abderrahmane Bendali, Pierre Borderies, Simon Tournier*

11h30–12h00 Approximations to Wave Propagation Through Doubly-Periodic Arrays of Clusters

*Anton Krynkin, Phil McIver*

12h00–12h30 A Periodic FMM for Maxwell's Equations with Applications to Nanophotonics

*Yoshihiro Otani, Yosuke Kurami, Naoshi Nishimura*

**Room Gérard de Nerval: Session Perfectly Matched Layers (II).** Chair: Daniel Appelo

10h30–11h00 Leaky Modes in an Open Waveguide

*Anne-Sophie Bonnet-Ben Dhia, Benjamin Goursaud, Christophe Hazard, Andres Prieto*

11h00–11h30 Absorbing Boundary Layers for Scattering Problem Discretized in a Spectral Basis

*Yuriy Bidasyuk, Wim Vanroose, Jan Broeckhove, Frans Arickx*

11h30–12h00 Perfectly Matched Layer for the Second-Order Wave Equation

*Imbo Sim, Marcus Grote*

#### 14h00–15h00

**Auditorium Alfred de Vigny: Invited Lecture. Jan Hesthaven, Brown University, USA.**

Reduced Basis Methods for Electromagnetics

Chair: Gary Cohen

#### 15h00–16h30

**Auditorium Alfred de Vigny: Session High Performance Computing (III).** Chair: Wim Vanroose

15h00–15h30 Preconditioning the Helmholtz Equation with Complex Rotated Domains

*Bram Reys, Wim Vanroose*

15h30–16h00 High-Frequency Multiple Scattering Problems: An Appropriate Preconditioner for a Krylov Subspace Algorithm

*Yassine Boubendir, Fatih Ecevit, Fernando Reitich*

**Room Montpezat: Session High Frequency Wave Propagation (I)** Chair: Isabelle Terrasse.

15h00–15h30 On the Accuracy and the Conditioning of PUFEM for the Numerical Solution of High Frequency Elastic Wave Scattering

*Abdellah El Kacimi, Omar Laghrouche*

15h30–16h00 A Fast Method for Solving the Helmholtz Equation Based on Wave-Splitting

*Jelena Popovic, Olof Runborg*

**Room Alphan: Session Discontinuous Galerkin Methods and Decomposition Domains (III).**

Chair: Xavier Juvigny

15h00–15h30 An Efficient Domain Decomposition Method for Scattering Problems Involving a Deep Cavity

*Jennifer Bourguignon, François Alouges, David Levadou*

15h30–16h00 Using Hierarchical Matrices in a Feti Decomposition Method for Coupling Finite Elements and Boundary Elements in Large-Size Problems of Acoustic Scattering

*Xavier Juvigny, François-Xavier Roux*



**Room Gabard: Session Periodic and Random Media (II).** Chair: Liliana Borcea

15h00–15h30 Approximate Models for Wave Propagation Across Thin Periodic Interfaces  
*Bérangère Delourme, Housseem Haddar, Patrick Joly*

15h30–16h00 Two-Dimensional Waves Around Almost Periodic Arrangements of Scatterers  
*Paul Martin, Agnes Maurel*

16h00–16h30 Operator Factorization for Multiple-Scattering Problems and an Application to Periodic Media  
*Julien Coatléven, Patrick Joly*

**Room Lautréamont: Session Asymptotic Models (III).** Chair: Clair Poignard

15h00–15h30 On Anisotropic Singular Perturbations of Wave Equations  
*Abdelmouhcene Sengouga, Senoussi Guesmia*

15h30–16h00 Construction and Analysis of Improved Kirchoff Conditions for Acoustic Wave Propagation in a Junction of Thin Slots  
*Adrien Semin, Patrick Joly*

16h00–16h30 Relevant Homogenized Thick Plate Models for the Numerical Modeling of HF Waves Propagation in Honeycomb Core Sandwich Thin Structures  
*Bing Tie, Denis Aubry*

**Room Gérard de Nerval: Perfectly Matched Layers (III).** Chair : Dimitri Komatitsch

15h00–15h30 A Perfectly Matched Layer for the Schrödinger Equation  
*Anna Nissen, Gunilla Kreiss*

15h30–16h00 Numerical Modelling of Linear and Non-Linear Wave Propagation Using Improved Unsplit Convolutional Perfectly Matched Layer Boundary Conditions.  
*Roland Martin, Dimitri Komatitsch*

**17h00–19h00**

**Auditorium Alfred de Vigny: Minisymposium High-Order Methods for the Solution of Wave Propagation PDE Models With Applications to Electromagnetics and Geoseismics** organized by Stéphane Lanteri (II).

17h00–17h30 Higher-Order Finite Elements for Hybrid Meshes Using New Pyramidal Elements  
*Morgane Bergot, Gary Cohen, Marc Duruflé*

17h30–18h00 Using the Interior Penalty Discontinuous Galerkin method for the Reverse Time Migration  
*Caroline Baldassari, Hélène Barucq, Henri Calandra, Bertrand Denel, Julien Diaz*

18h00–18h30 Recent Developments of the ADER-Discontinuous Galerkin Scheme for Computational Seismology: A Critical View on its Advantages and Disadvantages  
*Martin Kaeser, Cristobal Castro, Verena Hermann, Josep de la Puente, Christian Pelties*

18h30–19h00 Analysis of a Discontinuous Galerkin Method for 3D Elastic Wave Propagation  
*Sarah Delcourte, Nathalie Glinsky-Olivier, Loula Fezoui*

**Room Montpezat: Session Integral Equations (I).** Chair Eric Darrigrand

17h00–17h30 Numerical Resolution of a Volume Integral Equation: Treatment of Singularities  
*El Hadji Koné, Martin Costabel, Eric Darrigrand, Daniel Martin*

17h30–18h00 Accurate and Robust Computation of Photonic Crystal Band Structure Using Second-Kind Integral Equations  
*Alex Barnett, Leslie Greengard*

18h00–18h30 Industrial Applications of Retarded Potentials  
*Guillaume Sylvand, Isabelle Terrasse, Fanny Darbas*

18h30–19h00 Discontinuous Galerkin and Retarded Potentials for Time Dependent Wave Propagation Problems on Unbounded Domains

*Toufic Abboud, Patrick Joly, Jerónimo Rodríguez, Isabelle Terrasse*

**Room Alphand: Session Seismic Waves (II).** Chair: Abdelaaziz Ezziani

17h00–17h30 FDTD Based Seismic Modeling and Reverse Time Migration on a GPU Cluster

*Rached Abdelkhalek, Henri Calandra, Olivier Coulaud, Guillaume Latu, Jean Roman*

17h30–18h00 A Coupled 2D Finite-Elements - Finite-Difference Method for Seismic Wave Propagation: Case of a Semi-Circular Canyon

*Ariane Ducellier, Hideo Aochi*

18h00–18h30 2D Inversion of Seismic Well Data

*Ludovic Metivier, Florence Delprat-Jannaud*

**Room Gabard: Session Absorbing Boundary Conditions (II).** Chair: Dan Givoli

17h00–17h30 Transparent Boundary Condition for Periodic Media: Numerical Analysis.

*Sonia Fliss, Patrick Joly*

17h30–18h00 Transparent Boundary Conditions for Electromagnetic Waves in Unbounded Periodic Media

*Sofiane Soussi, Thorsten Hohage*

18h00–18h30 3D Numerical Implementation of Transparent Boundary Conditions in Elastic Waveguides

*Vahan Baronian, Anne-Sophie Bonnet-Ben Dhia, Eric Lunéville*

18h30–19h00 Dirichlet-To-Neumann Operators for an Acoustic Waveguide With a Uniform Flow and an Impedance Boundary Condition

*Jean-François Mercier, Anne-Sophie Bonnet-Ben Dhia, Christophe Hazard, Emmanuel Redon*

**Room Lautréamont: Session Asymptotic Models (IV).** Chair: Bing Tie

17h00–17h30 Approximate Transmission Conditions for the Laplacian in a High Contrast Medium with a Thin Layer. The Influence of the Curvature.

*Ronan Perrussel, Clair Poignard*

17h30–18h00 Stability Analysis of Acoustic Wave Propagation in a Thin Duct in the Presence of a Shear Flow

*Anne-Sophie Bonnet-Ben Dhia, Marc Duruflé, Patrick Joly*

18h00–18h30 A Quasi-1D Model for Aeroacoustics in Thin Ducts

*Lauris Joubert, Patrick Joly, Ricardo Weder*

18h30–19h00 Geometrical acoustic in moving flow

*Youness Noumir*

**Room Gérard de Nerval: Session Elastic Waves (II).** Chair: Ignacio Muga

17h00–17h30 SH-Waves in a Class of Inhomogeneous Anisotropic Media

*Carlos Daros*

17h30–18h00 *Vadim Lisitsa, Dmitry Vishnevsky*

Propagation of Elastic Waves Through Curved Interfaces and Diffraction Phenomenon

18h00–18h30 Invisibility for Bending Waves in Elastic Plates

*Mohamed Farhat, Sébastien Guenneau, Stefan Enoch, Alexander Movchan*

Friday					
9h00-10h00	<b>Invited Talk</b> : Housseem Haddar Transmission Eigenfrequencies for Dielectrics and their Use in the Identification Problem Chair : Rabia Djellouli				
10h00-10h30	Coffee Break in room Henri Faisans				
	Auditorium Alfred de Vigny	Room Montpezat	Room Alphand	Room Gabard	Room Lautréamont
10h30-12h30	Integral Equations (II) Chair : Simon Chandler-Wilde	Seismic Waves (III) Chair : Vadim Lisitsa	Periodic and Random Media (III) Chair : Brigitte Bidegaray-Fesquet	Absorbing Boundary Conditions (III) Chair : Geza Seriani	High-Frequency Wave Propagation (II) Chair : Guillaume Sylvand
12h30-14h00	Lunch (Buffet) in "Salle des ambassadeurs"				

## Friday, June 18

**9h00–10h00**

**Auditorium Alfred de Vigny: Invited Lecture. Housseem Haddar, INRIA Saclay, France.**

Transmission Eigenfrequencies for Dielectrics and their Use in the Identification Problem

Chair: Rabia Djeloulli

**10h30–12h30**

**Auditorium Alfred de Vigny: Session Integral Equations (II).** Chair : Simon Chandler-Wilde

10h30–11h00 Fast Multipole Galerkin-BEM for the Transmission Problem in Acoustics

*Liwei Xu, George Hsiao*

11h00–11h30 Efficient Algorithms for High Frequency Surface Scattering

*Mahadevan Ganesh, Stuart Hawkins*

11h30–12h00 High Frequency Scattering by a Convex Polygon with Impedance Boundary Condition

*Mosiamisi Mokgolele, Stephen Langdon, Simon Neil Chandler-Wilde*

12h00–12h30 Taking Into Account Geometrical Singularities in the GCSIE for Laplace and Helmholtz Problems.

*S everine Molko, Fran ois Alouges, David Levadoux*

**Room Montpezat: Session Seismic Waves (III).** Chair: Vadim Lisitsa

10h30–11h00 One-Way Wave Propagation With Symmetric Square Root

*Tim Op 't Root, Chris Stolk*

11h00–11h30 Asymptotic Inversion of Multicomponent data of Offset Vertical Seismic

*Maksim Protasov, Vladimir Tcheverda*

11h30–12h00 Numerical Simulation of a Tsunami Source

*Tatiana Voronina*

**Room Alphan : Session Periodic and Random Media (III).** Chair: Brigitte Bidegaray-Fesquet

10h30–11h00 Phase Sensitivity to Perturbations of a Periodic Scatterer

*Stephen Shipman*

11h00–11h30 Reiterated Homogenization and 3D-Negative Permittivity Tensors

*Guy Bouchitte, Christophe Bourel*

11h30–12h00 Impact of Metallic Interface Description on Sub-Wavelength Cavity Mode Computations

*Brigitte Bidegaray-Fesquet, Eric Dumas*

12h00–12h30 Homogenization of 3D-Dielectric Photonic Crystals and Artificial Magnetism

*Guy Bouchitte, Christophe Bourel, Didier Felbacq*

**Room Gabard: Session Absorbing Boundary Conditions (III).** Chair: Geza Seriani

10h30–11h00 Approximate Local Non-Reflecting Boundary Conditions for Anisotropic Navier Wave Equation

*Ivan Sofronov*

11h00–11h30 Spectral Properties of the Dirichlet-To-Neumann Operator for Exterior Helmholtz Problem and Its Applications to Scattering Theory

*Evgeny Lakshantov*

11h30–12h00 Penalization Methods for Hyperbolic IBVP: Semi-Transparent Walls Generation in the Small Porosity Limit

*Bruno Fornet*

12h00–12h30 Transparent Boundary Conditions for Elastic Anisotropic (VTI) Media: Axial-Symmetric Case

*Olga Podgornova*

**Room Lautréamont: Session High Frequency Wave Propagation (II).** Chair: Guillaume Sylvand

10h30–11h00 Strichartz Estimates for Non-Unitary Energy Bounds and Eigenfunction Estimates

*Melissa Tacy*

11h00–11h30 The Computation of Local Solutions to High Frequency Scattering Problems

*Andreas Asheim, Daan Huybrechs*

11h30–12h00 Parametrix for Non Strictly Hyperbolic (but Diagonalizable) Operators: from Local to Global Theory

*Philippe Delorme*

12h00–12h30 Propagation of Elastic Waves Through Curved Interfaces and Diffraction Phenomenon

*Joan Staudacher*