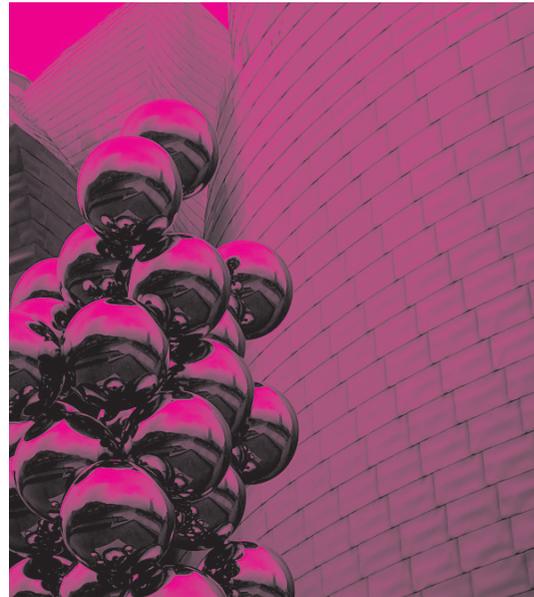
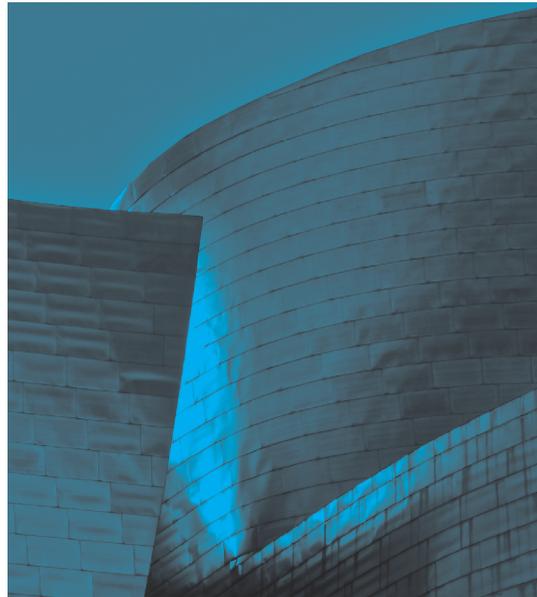


# (m<sup>2</sup>op)<sup>III</sup>

## THIRD INTERNATIONAL WORKSHOP ON MULTIPHYSICS, MULTISCALE, AND OPTIMIZATION PROBLEMS

May 22 & 23, 2014

### Agenda



Contact info:  
David Pardo Z.  
dzubiaur@gmail.com  
Phone: (+34) 697 37 36 68

**9:00 Workshop Opening and Presentation:**  
*D. Pardo (UPV/EHU and Ikerbasque, Spain).*

**Session 1: Advanced Methods for Subsurface Visualization. Chair: I. Muga (PUCV, Chile).**

**9:10 “Advanced Algorithms for the Modelling and Inversion of 3D Seismic and Electromagnetic Waves: An HPC Approach”,** by Josep de la Puente, (Barcelona Supercomputing Center, Spain).

**9:40 “Uncertainty Analysis in High Dimensional Nonlinear Inverse Problems”,** by Juan Luis Fernández (University of Oviedo Spain).

**10:10 “High-Order Non-Conforming Finite Element Methods for Time Domain Elasto-Acoustic Problems”,** by Angel Rodríguez-Rozas (Univ. Pau, France).

**10:40 “A Fourier Finite Element Method for the Simulation of Marine CSEM Measurements”,** by Shaaban Bakr (University of Assiut, Egypt).

**11:10 Coffee Break**

**Session 2: Advanced Methods for Subsurface Visualization. Chair: J. de la Puente (BSC, Spain).**

**11:30 “Fast Simulation of Direct Current (DC) Borehole Measurements using Model Reduction”,** by Ignacio Muga, (Pontificia Univ. Católica de Valparaíso, Chile).

**12:00 “Fast Inversion of Alternate Current (AC) Borehole Measurements using Model Reduction”,** by David Pardo (UPV/EHU and Ikerbasque, Spain).

**12:30 “Towards a fast adaptive multi-dimensional method for the inversion of magnetotelluric measurements”,** by Julen Álvarez-Aramberri (UPV/EHU, Spain and Univ. of Pau, France).

**13:00 “Goal-Oriented Adaptivity for Wave Propagation Problems using Multiple Dual Problems”,** by Vincent Darrigrand (UPV/EHU, Spain).

**13:30 Lunch at Asador Ibañez de Bilbao.**

**Session 3: Advanced Methods for Subsurface Visualization. Chair: V.M. Calo (KAUST, Saudi Arabia).**

**15:30 “Success and Challenges on 3D Geoelectrical Imaging on Reservoirs: the Deep Saline Aquifer of Hontomín for CO<sub>2</sub> storage, and the Tenerife Geothermal Reservoir Examples”,** by Juanjo Ledo (Universidad de Barcelona, Spain).

**16:00 “A Semi-analytical Method to Solve the Equilibrium Equations of Axisymmetric Elasticity in a Half-Space with a Hemispherical Pit”,** by Eduardo Godoy (Ingmat, Chile).

**16:30 “Helmholtz Equation in a Heterogeneous Media: A Two-Scale Analysis”,** by Theophile Chaumont, (University of Pau, France).

**17:00 End of First day of workshop**

**17:15 Visit to Guggenheim Museum**

**Session 4: Advanced Numerical Methods and HPC. Chair: J. Jansson (BCAM, Spain).**

**9:00 “A DPG Formulation Based on Locally H-Laplacian Trial and Test Spaces”,** by Albert Romkes, (South Dakota School of Mines and Technology, USA).

**9:30 “PetIGA: High Performance Isogeometric Analysis”,** by Lisandro Dalcin, (KAUST, Saudi Arabia).

**10:00 “On refinement techniques for Tetrahedral Finite Element Meshes”,** by Sergey Korotov, (BCAM, Spain).

**10:30 “Parallel Multi-Frontal Solver for Isogeometric Finite Element Methods on GPUs”,** by Maciej Paszynski, (AGH University, Krakow, Poland).

**11:00 Coffee Break**

**Session 5: Advanced Numerical Methods and HPC. Chair: L. Remaki (UPV/EHU, Spain)**

**11:20 “Global-Local Nonlinear Model Reduction for Flows in Heterogeneous Porous Media”,** by Victor M. Calo, (KAUST, Saudi Arabia).

**11:50 “Automated Adaptive Finite Element Methods with Applications in Massively Parallel Simulation of Turbulent flow and Fluid-structure Interaction”,** by Johan Jansson, (BCAM, Spain).

**12:20 “Numerical Model for Characterization of Double-Skin Perforated Sheet Facades; Experimental Validation Procedure and Optimization Assessment”,** by Jesus M. Blanco, (UPV/EHU, Spain).

**12:50 “Block Preconditioners for B-Splines Divergence Conforming Mixed Elements”,** by Adriano Cortes (KAUST, Saudi Arabia).

**13:20 Lunch at BCAM (“pintxos”).**

**Session 6: Multiphysics and Optimization Problems. Chair: V.M. Calo (KAUST, Saudi Arabia)**

**15:00 “Firedrake: a High-level, Portable Finite Element Computation Framework”,** by Florian Rathgeber (Imperial College London, UK).

**15:30 “VOF based Approach for Unsteady Turbofans Simulation”,** by Lakhdar Remaki (BCAM, Spain).

**16:00 “Stokes/Darcy Coupling in Filtration Problems”,** by Luca Gerardo-Giorda (BCAM, Spain).

**16:30 “Tools for Optimizing the Decision Making on Two Industrial Processes: Chain Manufacturing and Tunnel Building”,** by Carlos Gorria (UPV/EHU, Spain).

**17:00 End of workshop**

**20:45 Workshop Dinner at Casa Rufo.**

Introduction.  
Objectives.  
Methodology.  
Radiation formulation.  
Numerical model:  
  Sheet.  
  Glass.  
  Interior.  
  Parameters.  
  Capabilities.  
Experimental test:  
  Layout.  
  Instrumentation.  
  Characteristics.  
Validation.  
  Validation chart.  
  External effects.  
Thermal behavior:  
  Colour.  
  Material.  
  Perforation rate.  
  Summary.  
Energyplus model:  
  Parametric.  
  Validation.  
  Results.  
  Width influence.  
  Scope.  
  Energy savings.  
  Optimization.  
Conclusions.  
References.

### **Acknowledgements.**



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