

# Contents

## Part I Theory

<b>Optimal Control of Partial Differential Equations</b> .....	3
Eduardo Casas and Mariano Mateos	
<b>Introduction to First-Principle Simulation of Molecular Systems</b> .....	61
Eric Cancès	
<b>Accurate Computations and Applications of Some Classes of Matrices</b> .....	107
J.M. Peña	
<b>Introduction to Communication Avoiding Algorithms for Direct Methods of Factorization in Linear Algebra</b> .....	153
Laura Grigori	

## Part II Applications

<b>Singular Traveling Waves and Non-linear Reaction-Diffusion Equations</b> .....	189
Juan Calvo	
<b>Numerical Simulation of Flows Involving Singularities</b> .....	195
Maria Garzon, James A. Sethian, and August Johansson	
<b>A Projection Hybrid Finite Volume-ADER/Finite Element Method for Turbulent Navier-Stokes</b> .....	201
A. Bermúdez, S. Busto, J.L. Ferrín, L. Saavedra E.F. Toro, and M.E. Vázquez-Cendón	
<b>Stable Discontinuous Galerkin Approximations for the Hydrostatic Stokes Equations</b> .....	207
F. Guillén-González, M.V. Redondo-Neble, and J.R. Rodríguez-Galván	

<b>A Two-Step Model Identification for Stirred Tank Reactors: Incremental and Integral Methods .....</b>	<b>213</b>
A. Bermúdez, E. Carrizosa, Ó. Crego, N. Esteban, and J.F. Rodríguez-Calo	
<b>Variance Reduction Result for a Projected Adaptive Biasing Force Method .....</b>	<b>221</b>
Houssam AlRachid and Tony Lelièvre	
<b>Modeling Chemical Kinetics in Solid State Reactions .....</b>	<b>229</b>
J.A. Huidobro, I. Iglesias, B.F. Alfonso, C. Trobajo, and J.R. Garcia	
<b>ASSR Matrices and Some Particular Cases .....</b>	<b>235</b>
P. Alonso, J.M. Peña, and M.L. Serrano	
<b>A Computational Approach to Verbal Width in Alternating Groups .....</b>	<b>241</b>
Jorge Martínez Carracedo and Consuelo Martínez López	
<b>Improvements in Resampling Techniques for Phenotype Prediction: Applications to Neurodegenerative Diseases .....</b>	<b>245</b>
Juan Carlos Beltrán Vargas, Enrique J. deAndrés-Galiana, Ana Cernea, and Juan Luis Fernández-Martínez	
<b>An Aortic Root Geometric Model, Based on Transesophageal Echocardiographic Image Sequences (TEE), for Biomechanical Simulation.....</b>	<b>249</b>
Marcos Loureiro-Ga, Maria F. Garcia, Cesar Veiga, G. Fdez-Manin, Emilio Paredes, Victor Jimenez, Francisco Calvo-Iglesias, and Andrés Iñiguez	

Computational Mathematics, Numerical Analysis and  
Applications

Lecture Notes of the XVII 'Jacques-Louis Lions'

Spanish-French School

Mateos, M.; Alonso, P. (Eds.)

2017, XV, 254 p. 48 illus., 24 illus. in color., Hardcover

ISBN: 978-3-319-49630-6