



**POLITECNICO  
DI TORINO**



Dipartimento di  
Scienze Matematiche  
G. L. Lagrange

ECCELLENZA 2018 · 2022

Wednesday the **18 July 2018** at 10:00

Politecnico di Torino, DISMA, Aula Buzano (third floor)

**Alice RAELI**

Post-doctoral fellow at Institut Montpellierain Alexander Grothendieck

## **Numerical Modelling of Elliptic Problems on Octree-based Meshes**

Prof. Stefano Berrone moderates the discussion

### **Abstract**

In the framework of Energy Store Technologies and Phase Changing Materials, the geometry of the system or the way in which some of its properties are described may induce internal discontinuities. As a consequence, there arises the need for solving linear elliptic equations with varying coefficients across internal interfaces, which implies that the gradient of the solution can undergo significant variations through the internal boundaries.

In this seminar, Dr Raeli will present a compact finite-difference scheme on a tree-based adaptive grid that can be efficiently solved using a natively parallel data structure. Numerical illustrations are offered in both two and three-dimensional configurations. Future perspectives to improve the solution of elliptic problems in the presence of discontinuities will include the usage of Hybrid High-Order methods to increase the approximation order.

### **Biography**

Since October 2017, Alice Raeli has been a Post-doctoral Fellow in Applied Mathematics at the Institut Montpellierain Alexander Grothendieck, working in the ACSIOM Team project. She received her PhD in Applied Mathematics in 2017 from the Université de Bordeaux, where she studied under the supervision of Prof. Angelo Iollo, Prof. Mejd Azaïez, and Prof. Michel Bergmann.

She has been working on adaptive meshes, multigrid methods for elliptic problems. The focus of her current research is on parallel strategies on octrees for Hybrid High Order methods.

*Enjoy a great summer time!*

*Weekly seminars will be back on September 2018. Stay tuned!*

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