

Carlo Marcati

Curriculum Vitæ

4, place Jussieu
75005 Paris (France)
+33 7 51 25 85 32
✉ carlo.marcati@upmc.fr
🌐 ljll.math.upmc.fr/marcati
Born June 2, 1988

Education

- 2013 – ongoing **PhD in Mathematics**, *Laboratoire Jacques-Louis Lions – Université Pierre et Marie Curie*, Paris, France.
Under the supervision of prof. Yvon Maday
- 2011 – 2013 **MSc in Mathematical Engineering**, *Politecnico di Milano*, Milano, Italy.
Final mark obtained: 110/110 cum Laude.
- 2007 – 2011 **BSc in Mathematical Engineering**, *Politecnico di Milano*, Milano, Italy.
Final mark obtained: 110/110 cum Laude.

Research Interests

- PhD thesis **hP discontinuous Galerkin finite element method for electronic structure calculations.**
We use an hP discontinuous Galerkin method to approximate the solution to problems arising in quantum chemistry. In particular, we consider all-electron potentials, which give rise to wavefunctions belonging to weighted Sobolev spaces. We prove *a priori* estimates on the exponential convergence of the method and perform computational experiments.
- Areas of specialization Numerical Analysis; Analysis of PDEs; Computational Science.

Publications & Talks

Journal articles

- 2015 Paola F. Antonietti, Carlo Marcati, Ilario Mazzieri, and Alfio Quarteroni. High order discontinuous Galerkin methods on simplicial elements for the elastodynamics equation. *Numerical Algorithms*, 71(1):181–206, 2015

Conference Presentations & Seminar Talks

- Juin 2017 SMAI 2017, La Tremblade (France).
- April 2017 Journée Interne du Laboratoire Jacques Louis Lions, UPMC Univ. Paris 6, Paris (France).
- September 2016 Séminaire d'Analyse numérique de l'IRMAR, Rennes (France).
- July 2016 Mathematical and numerical analysis of electronic structure models, Roscoff (France).
- June 2016 Journées Singulières, Nancy (France).
- May 2016 Congrès d'Analyse Numérique (CANUM), Obernai (France).
- January 2016 Adaptive algorithms for computational PDEs, Birmingham University, Birmingham (UK).
- August 2015 Minisymposium on Mathematical and Numerical Aspects of Electronic Structure Theory, International Conference on Industrial and Applied Mathematics (ICIAM), Beijing (China).
- May 2015 PhD students seminar, Laboratoire Jacques-Louis Lions (LJLL) UPMC Univ. Paris 6, Paris (France).
- October 2014 Journée Interne du Laboratoire Jacques-Louis Lions, UPMC Univ. Paris 6, Paris (France).

Posters

- May 2017 YM60, Roscoff (France).
- April 2015 Lions-Magenes Days, University of Pavia, Pavia (Italy).
- July 2014 Electronic Structure Theory for Materials and (Bio)molecules, UCLA, Los Angeles (USA).

Seminar organization, Fellowships & Grants

Seminar organization

2015 – 2016 **Organization of the PhD students seminar of LJLL.**

Fellowships & Grants

2013 – 2016 **Allocation doctorale DIM RDM-IdF.**

2016 **Projet BOUM, SMAI.**

Summer Schools, Internships, Studies Abroad

August 2015 **Hands-on Summer School on Electronic Structure Theory for Materials and (Bio)molecules, UCLA, Los Angeles (USA).**

June 2013 **12th Summer School on Scientific Visualization, CINECA, Milano (Italy).**

Oct 2012 – Jan 2013 **Internship, IFOM-IEO campus, Milano (Italy).**

Sep 2011 – Jan 2012 **Tutor for the students of Ingegneria Matematica, Politecnico di Milano.**

Aug 2009 – Feb 2010 **Erasmus Exchange, École Polytechnique Fédérale de Lausanne (EPFL), Lausanne (CH).**

Teaching

2015 – 2017 **Approximation numérique des fonctions, TD and TP.**

2014 – 2015, **Méthodes numériques pour les équations différentielles, TD and TP.**

2016 – 2017

2014 – 2015 **Éléments de mathématiques, TD.**

Theses

Master thesis

Title **High order discontinuous Galerkin methods on simplicial elements for the elastodynamics equation**

Supervisors Prof. Alfio Quarteroni – Dr. Paola Francesca Antonietti

Abstract The simulation of seismic wave propagation problems requires a great flexibility in the mesh construction. The employment of spectral elements methods on tetrahedral meshes (TSEM) enables the coupling of a high order approximation with the adaptivity provided by tetrahedral and triangular grids. Different approaches to the TSEM and numerical schemes are investigated, analyzing their dissipation, dispersion, stability, convergence and accuracy properties in the context of a discontinuous approximation.

Bachelor thesis

Title **Traffic flow models**

Supervisor Prof. Alfio Quarteroni

Language skills

Mother tongue **Italian**

Other languages

English

French

Reading

Excellent

Excellent

Writing

Excellent

Excellent

Speaking

Excellent

Excellent

Certifications Cambridge ESOL – Certificate of Proficiency in English (CEFR level C2).