Athena Picarelli

Curriculum Vitae

Personal Data

Given Name Athena

Family Name Picarelli

Nationality Italian

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Current Position

Apr18- **Temporary Assistant Professor (RTDA)**, *Department of Economics, University of Verona.*

Positions held

Oct17-Mar18 **CFM research fellowship**, *Mathematics Department, Imperial College London.*

Jan17-Sep17 **Post-doc research fellowship**, *Mathematics Department (Mathematical and Computational Finance Group), University of Oxford* .

Jan15-Dec16 **Nomura research fellowship**, *Mathematics Department (Mathematical and Computational Finance Group), University of Oxford* .

Research interests

Stochastic control, Optimal control problems, Dynamic Programming approach, first and second order Hamilton-Jacobi equations, numerical schemes for solving Hamilton-Jacobi equations, Computational Finance.

Education

March 2011 **Master of Science in Applied Mathematics**, *Università di Roma "La Sapienza".*

January 2008 **Bachelor in Mathematics**, *Università di Roma "La Sapienza".*

PhD thesis

Nov11-Apr15 ITN SADCO Marie-Curie fellowship, FR7 EU program & INRIA-Saclay Île de France.

Thesis **On some stochastic control problems under state constraints**.

Supervisors Prof. Hasnaa Zidani, Prof. Olivier Bokanowski

Papers in peer-reviewed journals

2018 A. Kröner, A. Picarelli, H. Zidani. *Infinite horizon stochastic optimal control problems with running maximum cost.*
SIAM J. Control and Optim. To appear.

2018 O. Bokanowski, A. Picarelli, C. Reisinger. *High-order filtered schemes for time-dependent second order HJB equations*. ESAIM: M2AN, Vol. 54 (1), pp. 69-97.

2016 O. Bokanowski, A. Picarelli, H. Zidani. *State-constrained stochastic optimal control problems via reachability approach*. SIAM J. Control and Optimization, Vol. 54 (5), pp. 2568-2593.

2015 L. Grüne, A. Picarelli. *Zubov's method for controlled diffusions with state constraints*. Nonlinear Differential Equations and Applications, Vol. 22 (6), pp. 1765-1799.

2015 O. Bokanowski, A. Picarelli, H. Zidani. *Dynamic Programming and error estimates for stochastic control problems with maximum cost.* Applied Mathematics and Optimization, Vol. 71 (1), pp. 125-163.

2012 S. Cacace, E. Cristiani, M. Falcone, A. Picarelli. *A patchy dynamic programming scheme for a class of Hamilton-Jacobi-Bellman equations*. SIAM J. Scientific Computing, Vol. 34 (5) , pp. A2625-A2649.

Papers in peer-reviewed proceedings and book chapters

2018 M. Assellaou, A. Picarelli. *A Hamilton-Jacobi-Bellman approach for the numerical computation of probabilistic state constrained reachable sets*. Proceedings of the workshop "Numerical methods for Optimal Control problems". To appear.
Preprint https://hal.archives-ouvertes.fr/hal-01633423

2018 A. Picarelli, C. Reisinger, J. Rotaetxe. *Boundary Mesh Refinement for Semi-Lagrangian Schemes*. In Kalise et al (Ed.), "Hamilton-Jacobi-Bellman Equations. Numerical Methods and Applications in Optimal Control" (pp. 167—188).
Radon Series on Computational and Applied Mathematics, De Gruyter (2018).

2017 A. Festa, R. Guglielmi, C. Hermosilla, A. Picarelli, S. Sahu, A. Sassi, F. Silva.
Recent results in Hamilton-Jacobi-Bellman theory. Book chapter in "Optimal Control Design: Novel Directions and Applications". Springer, Lecture notes in Mathematics. DOI: 10.1007/978-3-319-60771-9.

Preprints and ongoing works

A. Picarelli, C. Reisinger. *Probabilistic error analysis for some approximation schemes to optimal control problems*. Submitted.

A. Picarelli, C. Reisinger. *Duality-based a posteriori error estimates for some approximation schemes for convex optimal control problems*.
Submitted. Preprint https://hal.archives-ouvertes.fr/hal-01538617

A. Picarelli, C. Reisinger, J. Rotaetxe. *Error bounds for monotone schemes for parabolic Hamilton-Jacobi-Bellman equations in bounded domains*.
Submitted. Preprint https://hal.archives-ouvertes.fr/hal-01585766

O. Bokanowski, A. Picarelli, C. Reisinger. *Stability results for second order backward differentiation schemes for parabolic Hamilton-Jacobi-Bellman equations*.
Submitted. Preprint https://hal.archives-ouvertes.fr/hal-01628040.

Research visits

Nov13–Feb14 **Universitá degli studi di Padova (Italy)**, *Visiting Prof. Bardi and Prof. Cesaroni*.

May-Jun 14 **Universität Bayreuth (Germany)**, *Visiting Prof. Grüne*.

Invited conference and seminar talks

Jun 2018 Stochastic Modeling and Financial Applications, Università di Verona, Italy

May 2018 Workshop, Stochastic Control and Applications, Università di Verona, Italy

Apr 2018 Risk & Stochastic Conference, LSE, UK.

Mar 2018 Workshop, Stochastic analysis and Applications, University of Santiago, Chile.

Jan 2018 Mathematical and Computational Finance Seminar, University of Oxford, UK.

Jan 2018 Differential Equations and their Applications Seminar, Università di Padova, Italy.

Dec 2017 Verona-Paris Conference on Stochastic Modeling, Università di Verona, Italy.

Oct 2017 Numerical Analysis Seminar, University of Oxford, UK.

Oct 2017 Mathematical Finance Seminar, Politecnico di Milano, Italy.

Sep 2017 International Conference on Computational Finance, Lisbon, Portugal.

Jun 2017 Workshop Numerical methods for optimal control problems, Rome, Italy.

Jan 2017 Risk & Stochastics and Financial Mathematics Seminar, LSE, UK.

Nov 2016 Workshop, Numerical Methods for HJ equations in Optimal Control, Linz, Austria.

Sept 2016 Congress of the Italian Society of Industrial and Applied Mathematics, Milano, Italy.

March 2016 Workshop Analysis and Applications of Stochastic Systems, Rio de Janeiro, Brasil.

Jan 2016 Numerical Analysis Seminar, University of Durham, UK.

Jan 2016 5th Chilean Workshop on Numerical Analysis of PDEs, Conception, Chile.

Nov 2015 9th Oxford-Princeton Workshop on Financial Mathematics, Princeton, USA.

May 2015 13th Viennese Workshop on Optimal Control and Dynamic Games, Vienne, Austria.

Feb 2015 Mathematical & Computational Finance Seminar, Oxford University, UK.

Nov 2014 Workshop, New Perspectives in Optimal Control and Games, Rome, Italy.

Oct 2013 Differential Equations and their Applications Seminar, University of Padova, Italy

March 2013 Differential Numerical Modeling Seminar, Università di Roma "La Sapienza", Italy.

Feb 2013 Probability Seminar, Evry University, France.

Nov 2012 Probability, Statistics and Control Seminar, ENSTA ParisTech, France.

Teaching Experience

Nov 2016 Finite difference methods
Lectures, *University of Oxford, MSc in Mathematical and Computational Finance.*

Jan-Jun 2016 Calculus (1st year), Calculus of variations (2nd year).
Tutorials, *St Catherine's College, University of Oxford.*

Oct-Dec 2015 Probability (1st year), Differential Equations (2nd year).
Tutorials, *St Catherine's College, University of Oxford.*

Jan-Feb 2015 Introduction to Stochastic control (Prof. Xunyu Zhou).
Tutorials, *University of Oxford, MSc in Mathematical and Computational Finance.*

January 2014 SADCO-WIAS Young researchers Workshop, Berlin, Germany, 29-31 January 2014.
Mini-course on Stochastic Optimal Control.

Oct-Dec 2012 Numerical methods for PDEs in finance (Prof. Olivier Bokanowski).
Tutorials, *ENSTA ParisTech, Paris, France.*

Supervisions

2017 Co-supervision of the Master project of Qi Huang
"A comparison of hybrid and filtered schemes for HJB equations".

2016 Co-supervision of the PhD thesis of Julen Rotaetxe
"Boundary treatment and multigrid preconditioning for semi-Lagrangian schemes applied to Hamilton-Jacobi-Bellman equations".

Administration and Collective responsibilities

Jul 18 - Associate editor for the Journal of Computational Finance.

July 2018 Co-organizer of the special session "Modeling and Computational Methods for Financial Applications" at the Conference ORCOS (Viennese Conference on Optimal Control and Dynamic Games), TU Wien, Austria.

Sep-Dec 2016 Co-organizer of the Mathematical Finance internal seminar, University of Oxford.

June 2013 Co-organizer of the SADCO 'Doctoral Days' at ENSTA ParisTech.

Referee for the journals: SIAM Journal on Control and Optim., SIAM Journal on Scientific Computing, Journal of Optimization Theory and Applications, Communications on Pure and Applied Analysis, Appl. Math. Optim., et al.

Awards

Jan 2016 Qualification aux fonctions de Maître de Conférences (French system)

Nov 2015 INDAM (Italian Institute of High Mathematics) grant for young researchers, group GNCS (Group on Numerics and Computer Science).

July 2014 Financial support award for the participation to the conference HYP2014, Rio de Janeiro, Brazil, 28 July- 1 August 2014.

Nov 2011 ITN Marie-Curie SADCO 3 years fellowship.

Languages

	Writing skill	Reading skill	Speaking skill
Italian	Mother tongue		
English	Advanced	Advanced	Advanced
French	Advanced	Advanced	Advanced
Spanish	Beginner	Beginner	Beginner

Computer skills

Mathematica, C, C++, OpenOffice, Linux, Microsoft Windows, LaTeX, MatLab

Possible contacts for references

- **Christoph Reisinger**: University of Oxford, christoph.reisinger@maths.ox.ac.uk +44 1865 273525
- **Hasnaa Zidani**: ENSTA ParisTech, housnaa.zidani@ensta-paristech.fr +33 1 81872117
- **Olivier Bokanowski**: Université Paris 7,olivier.bokanowski@gmail.com +33 1 57279119
- **Maurizio Falcone**: Università La Sapienza di Roma, falcone@mat.uniroma1.it +39 6 49913279
- **Lars Grüne**: University of Bayreuth, lars.gruene@uni-bayreuth.de +49 921 553270
- **Bruno Bouchard**: Université Paris Dauphine, bouchard@ceremade.dauphine.fr
- **Rama Cont**: Imperial College, r.cont@imperial.ac.uk