

Curriculum Vitæ of ALESSANDRO RUSSO

Milano, January 20, 2016

Education

1983: Degree in Mathematics at the University of Torino with the thesis “On the buckling of cylindrical shells” (advisor: Prof. G. Geymonat).

1983-1986: Graduate student at the International School for Advanced Studies (Trieste)

Employment

October 2002 - present: Full Professor of Numerical Analysis at the University of Milano-Bicocca

November 1995 - September 2002: Senior Researcher at the Istituto di Analisi Numerica of CNR - Pavia (now IMATI-CNR)

May 1986 - October 1995: Researcher at the Istituto di Analisi Numerica of CNR - Pavia (now IMATI-CNR)

Service Activities

2013-2018: member of the Academic Senate of the University of Milano-Bicocca

2013-2015: deputy director of the Department of Mathematics and Applications

2002-2008: Director of the School for Applications of Mathematics in Industry (SAMI)

Teaching

2002-present: I have taught several courses at the University of Milano-Bicocca on Numerical Analysis, including Finite Elements, Fourier Analysis, Elementary Numerical Analysis both for students of Mathematics and students of Computer Science. I have also taught several PhD courses for the PhD Program in Mathematics of the University of Milano-Bicocca.

1990-2001: course “Numerical Analysis” at the Politecnico di Torino

Scientific interests

My scientific activity has been mainly focused on the numerical approximation of partial differential equations with the Finite Element Method. In particular, I have studied the following topics:

- Euler-Navier-Stokes coupling
- Advection-Diffusion equations with dominant advection
- Connection between SUPG and bubble stabilization for advection-diffusion equations
- Hourglass control in Finite Elements
- Virtual Element Method in primal and mixed form

Organization of Workshops and Schools

2016: Co-organizer with L. Beirao da Veiga, F. Brezzi, L.D. Marini of the minisymposium “High-order methods for polygonal and polyhedral meshes” for the ECCOMAS 2016 Conference, 5-10 June 2016, Crete Island, Greece

2015: Organizer of the Workshop “Discretization Methods for Polygonal and Polyhedral Meshes. 2015 Edition”, University of Milano-Bicocca, 11-13 February 2015

2012: Co-organizer with L. Beirao da Veiga, A. Cangiani, G. Manzini of the Workshop “Discretization Methods for Polygonal and Polyhedral Meshes: FEM, MFD, DG, VEM, XFEM and friends”, University of Milano-Bicocca, 17-19 September 2012

2002-2008: Director of the School for Applications of Mathematics in Industry (SAMI)
2006-2008: National Coordinator of the “Progetto Lauree Scientifiche - Stage e post Lauream” funded by the Italian ministry of education, university and research (MIUR)

Grants

2011-2013 Co-Investigator of the research project “PRIN2009: Modelli, Metodi e Calcolo Scientifico per Problemi di Elettrocardiologia e di Interazione Fluido-Struttura”, Programma Nazionale, Italy; national coordinator: Prof. A. Quarteroni (Politecnico di Milano)

2008-2010: Co-Investigator of the research project “PRIN2007: Modelli, metodi e calcolo scientifico per problemi di Elettrocardiologia e di Interazione Fluido-Struttura”, Programma Nazionale, Italy; national coordinator: Prof. A. Quarteroni (Politecnico di Milano)

2006-2008: Co-Investigator of the research project “PRIN2005: Calcolo Scientifico per problemi dell’Elettrocardiologia e dell’interazione Fluido-Struttura”, Programma Nazionale, Italy; national coordinator: Prof. A. Quarteroni (Politecnico di Milano)

2004-2005: Grant of 140.000 euros from Fondazione Cariplo for the School for Applications of Mathematics in Industry (SAMI)

2003-2005: Co-Investigator of the research project “PRIN2003: Modelli, Metodi e Calcolo Scientifico per l’Elettrocardiologia, l’Elettromagnetismo, l’Interazione Fluido-Struttura e per l’Elasticita’”, Programma Nazionale, Italy; national coordinator: Prof. A. Quarteroni (Politecnico di Milano)

Review activity

Reviewer for several international Journals, such as: Numerische Mathematik, Mathematical Modelling and Numerical Analysis, Computers & Structures, Mathematical Models and Methods in Applied Sciences, SIAM Journal on Numerical Analysis, Mathematics of Computations, Computer Methods in Applied Mechanics and Engineering, International Journal of Solids and Structures.

Invited talks (last 5 years)

”Virtual Element Methods for general second order elliptic problems”, at the Workshop on Polytopal Element Methods in Mathematics and Engineering, 26-28 October 2015, Georgia Tech, Atlanta, USA

”Virtual Element Methods for general second order elliptic problems on polyhedral meshes”, at the Workshop X-DMS 2015 - eXtended Discretization MethodS, 9-11 September 2015, Ferrara, Italy

”Virtual Element Spaces”, semi-plenary lecture at the the 18th International Conference on Finite Elements in Flow Problems (FEF), 16-18 March 2015, Taipei, Taiwan

”Hourglass Control by means of the Virtual Element Method”, at the the 18th International Conference on Finite Elements in Flow Problems (FEF), 16-18 March 2015, Taipei, Taiwan

”Hourglass Control by means of the Virtual Element Method”, WCCM IX ECCM V ECFD VI, July 2014, 2014 Barcelona, Spain

”Virtual Element Methods for general elliptic equations”, at the Workshop Building bridges: connections and challenges in modern approaches to numerical partial differential equations, July 7-16, 2014 EPSRC Durham Symposium, Durham, UK

”The Virtual Element Method”, contributed talk at the 12th European Finite Element Fair, May 29-30, 2014, Faculty of Mathematics, University of Vienna

”High-order Virtual Element Methods”, at the SIAM Conference on Computational Science and Engineering, February 25 – March 1, 2013, The Westin Boston Waterfront, Boston, Massachusetts, USA

”SUPG stabilization of the Virtual Element Method”, at the Workshop on Advances in Computational Mechanics 2013 - A Conference Celebrating the 70th Birthday of Thomas J.R. Hughes, February 24-27, 2013 San Diego, California, USA

”Virtual Element Methods II”, at the Workshop on Discretization Methods for Polygonal and Polyhedral Meshes, 17-19 September 2012, University of Milano-Bicocca, Milan, Italy

”Mimetic Projection Operators”, at the 5th LNCC Meeting 2012 on computational modeling, 16-19 July 2012, Petropolis, Brazil

”Hourglass (and SUPG) Stabilization in a Mimetic Framework”, at the 10th World Conference in Computational Mechanics (WCCM), 8-13 July 2012, Sao Paulo, Brazil

Bibliometric data

Papers on International SCOPUS Journals: 35

Papers on International ISI Journals: 39

Papers on International ISI Journals with citation data: 36

Total Citations (SCOPUS): 1166

Total Citations (ISI): 1317

Total Citations (SCOPUS with NO self-citations): 952

H-index (SCOPUS): 15

H-index (ISI): 16

Publications

- [1] Beirao da Veiga L, Brezzi F, Marini LD, and Russo A. Virtual element methods for general second order elliptic problems on polygonal meshes. *MATHEMATICAL MODELS AND METHODS IN APPLIED SCIENCES*, 2016.
- [2] Beirao da Veiga L, Brezzi F, Marini LD, and Russo A. Mixed virtual element methods for general second order elliptic problems on polygonal meshes. *MODLISATION MATHMATIQUE ET ANALYSE NUMRIQUE*, 2016.
- [3] Perugia I, Pietra P, and Russo A. A plane wave virtual element method for the helmholtz problem. *MODLISATION MATHMATIQUE ET ANALYSE NUMRIQUE*, 2016.
- [4] Beirao da Veiga L, Brezzi F, Marini LD, and Russo A. H(div) and h(curl)-conforming virtual element methods. *NUMERISCHE MATHEMATIK*, 2015.
- [5] Cangiani A, Manzini G, Russo A, and Sukumar N. Hourglass stabilization and the virtual element method. *INTERNATIONAL JOURNAL FOR NUMERICAL METHODS IN ENGINEERING*, 102:404–436, 2015.
- [6] Manzini G, Russo A, and Sukumar N. New perspectives on polygonal and polyhedral finite element methods. *MATHEMATICAL MODELS AND METHODS IN APPLIED SCIENCES*, 24:1665–1699, 2014.
- [7] Beirao da Veiga L, Brezzi F, Marini LD, and Russo A. The hitchhiker’s guide to the virtual element method. *MATHEMATICAL MODELS AND METHODS IN APPLIED SCIENCES*, 24:1541–1573, 2014.

- [8] Russo A, Serra Capizzano S, and Tablino Possio C. Quasi-optimal preconditioners for finite element approximations of diffusion dominated convection-diffusion equations on (nearly) equilateral triangle meshes. *NUMERICAL LINEAR ALGEBRA WITH APPLICATIONS*, 22:123–144, 2014.
- [9] Ahmad B, Alsaedi A, Brezzi F, Marini LD, and Russo A. Equivalent projectors for virtual element methods. *COMPUTERS & MATHEMATICS WITH APPLICATIONS*, 66:376–391, 2013.
- [10] Beirao Da Veiga L, Brezzi F, Marini LD, Manzini G, Cangiani A, and Russo A. Basic principles of virtual element methods. *MATHEMATICAL MODELS AND METHODS IN APPLIED SCIENCES*, 23:199–214, 2013.
- [11] Russo A and Tablino Possio C. Preconditioned hermitian and skew-hermitian splitting method for finite element approximations of convection-diffusion equations. *SIAM JOURNAL ON MATRIX ANALYSIS AND APPLICATIONS*, 31:997–1018, 2009.
- [12] Cangiani A, Manzini G, and Russo A. Convergence analysis of the mimetic finite difference method for elliptic problems. *SIAM JOURNAL ON NUMERICAL ANALYSIS*, 47, 2009.
- [13] Manzini G and Russo A. A finite volume method for advection-diffusion problems in convection-dominated regimes. *COMPUTER METHODS IN APPLIED MECHANICS AND ENGINEERING*, 197:1242–1261, 2008.
- [14] Schettini R, Russo A, Gasparini F, and Bianco S. A new method for rgb to xyz transformation based on pattern search optimization. *IEEE TRANSACTIONS ON CONSUMER ELECTRONICS*, 53:1020–1028, 2007.
- [15] Russo A. Streamline-upwind petrov/galerkin method (supg) vs residual-free bubbles (rfb). *COMPUTER METHODS IN APPLIED MECHANICS AND ENGINEERING*, 195:1608–1620, 2006.
- [16] Russo A, Brezzi F, and Marini LD. On the choice of a stabilizing subgrid for convection-diffusion problems. *COMPUTER METHODS IN APPLIED MECHANICS AND ENGINEERING*, 194:127–148, 2005.
- [17] Russo A, Asensio MI, and Sangalli G. The residual-free bubble numerical method with quadratic elements. *MATHEMATICAL MODELS AND METHODS IN APPLIED SCIENCES*, 14:641–661, 2004.
- [18] Russo A and Travaglini G. Il mestiere del matematico. *EMMECI QUADRO*, 18:142–145, 2003.
- [19] Arioli M, Noulard E, and Russo A. Stopping criteria for iterative methods: applications to pde’s. *CALCOLO*, 38:97–112, 2001.
- [20] Brezzi F, Manzini G, Marini D, Pietra P, and Russo A. Discontinuous galerkin approximations for elliptic problems. *NUMERICAL METHODS FOR PARTIAL DIFFERENTIAL EQUATIONS*, 16:365–378, 2000.

- [21] Franca LP and Russo A. Recovering supg using petrov-galerkin formulations enriched with adjoint residual-free bubbles. iv wccm (buenos aires, 1998). *COMPUTER METHODS IN APPLIED MECHANICS AND ENGINEERING*, 182:333–339, 2000.
- [22] Brezzi F, Hughes TJR, Marini LD, Russo A, and Suli E. A priori error analysis of residual-free bubbles for advection-diffusion problems. *SIAM JOURNAL ON NUMERICAL ANALYSIS*, 36:1933–1948, 1999.
- [23] Brezzi F, Franca LP, and Russo A. Further considerations on residual-free bubbles for advective-diffusive equations. *COMPUTER METHODS IN APPLIED MECHANICS AND ENGINEERING*, 166:25–33, 1998.
- [24] Franca LP, Farhat C, Lesoinne M, and Russo A. Unusual stabilized finite element methods and residual free bubbles. *INTERNATIONAL JOURNAL FOR NUMERICAL METHODS IN FLUIDS*, 27:159–168, 1998.
- [25] Canuto C, Russo A, and van Kemenade V. Stabilized spectral methods for the navier-stokes equations: residual-free bubbles and preconditioning. *COMPUTER METHODS IN APPLIED MECHANICS AND ENGINEERING*, 166:65–83, 1998.
- [26] Brezzi F, Marini D, and Russo A. Applications of the pseudo residual-free bubbles to the stabilization of convection-diffusion problems. *COMPUTER METHODS IN APPLIED MECHANICS AND ENGINEERING*, 166:25–33, 1998.
- [27] Brezzi F, Franca LP, Hughes TJR, and Russo A. $b = fg$. *COMPUTER METHODS IN APPLIED MECHANICS AND ENGINEERING*, 145:329–339, 1997.
- [28] Franca LP and Russo A. Mass lumping emanating from residual-free bubbles. *COMPUTER METHODS IN APPLIED MECHANICS AND ENGINEERING*, 142:353–360, 1997.
- [29] Franca LP and Russo A. Unlocking with residual-free bubbles. *COMPUTER METHODS IN APPLIED MECHANICS AND ENGINEERING*, 142:361–364, 1997.
- [30] Brezzi F, Marini D, Pietra P, and Russo A. A monotonic scheme for advection-diffusion problems. *TRANSPORT THEORY AND STATISTICAL PHYSICS*, 25:463–475, 1996.
- [31] Russo A. Bubble stabilization of finite element methods for advection-diffusion problems. *TRANSPORT THEORY AND STATISTICAL PHYSICS*, 25:395–408, 1996.
- [32] Russo A. A posteriori error estimators via bubble functions. *MATHEMATICAL MODELS AND METHODS IN APPLIED SCIENCES*, 6:33–41, 1996.
- [33] Russo A. Bubble stabilization of finite element methods for the linearized incompressible navier-stokes equations. *COMPUTER METHODS IN APPLIED MECHANICS AND ENGINEERING*, 132:335–343, 1996.
- [34] Franca LP and Russo A. Deriving upwinding, mass lumping and selective reduced integration by residual-free bubbles. *APPLIED MATHEMATICS LETTERS*, 9:83–88, 1996.

- [35] Franca LP and Russo A. Approximation of the stokes problem by residual-free macro bubbles. *EAST-WEST JOURNAL OF NUMERICAL MATHEMATICS*, 4:265–278, 1996.
- [36] Russo A. A posteriori error estimators for the stokes problem. *APPLIED MATHEMATICS LETTERS*, 8:1–4, 1995.
- [37] Brezzi F and Russo A. Choosing bubbles for advection-diffusion problems. *MATHEMATICAL MODELS AND METHODS IN APPLIED SCIENCES*, 4:571–587, 1994.
- [38] Zanino R and Russo A. Finite element fluid modeling of a poloidal divertor. *CONTRIBUTIONS TO PLASMA PHYSICS*, 34:410–414, 1994.
- [39] Canuto C and Russo A. On the elliptic-hyperbolic coupling. i. the advection-diffusion equation via the χ -formulation. *MATHEMATICAL MODELS AND METHODS IN APPLIED SCIENCES*, 3:145–170, 1993.
- [40] Canuto C and Russo A. A viscous-inviscid coupling under mixed boundary conditions. *MATHEMATICAL MODELS AND METHODS IN APPLIED SCIENCES*, 2:461–482, 1992.
- [41] Zanino R, Paolini M, and Russo A. Towards finite element modeling of the tokamak scrape-off layer. *CONTRIBUTIONS TO PLASMA PHYSICS*, 32:432–437, 1992.
- [42] Russo A. Uniqueness results for a class of nonlinear problems. *APPLIED MATHEMATICS LETTERS*, 4:39–42, 1991.
- [43] Brezzi F, Canuto C, and Russo A. A self-adaptive formulation for the euler/navier-stokes coupling. *COMPUTER METHODS IN APPLIED MECHANICS AND ENGINEERING*, 73:317–330, 1989.
- [44] Buzano E and Russo A. Bifurcation problems with $O(2) \oplus Z_2$ symmetry and the buckling of a cylindrical shell. *ANNALI DI MATEMATICA PURA ED APPLICATA*, 146:217–262, 1987.