Personal information

Surname / First name	**Carpentieri, Bruno**
Homepage	https://www.inf.unibz.it/~bcarpentieri/
Nationality	Italian

Research interests

High-performance scientific computing.
Parallel numerical linear algebra techniques.
Iterative solvers and preconditioners for linear systems. Eigenvalue solvers.
Computational Electromagnetics, Plasma Fusion.
Computational Fluid Dynamics, Electrophysiology.
Mathematical modelling.

Work experience

Dates	May 2017 - ongoing
Position held	Associate Professor in Applied Mathematics
Activities and responsibilities	Research, teaching, supervising,
Name and address of employer	Free University of Bolzano - Faculty of Computer Science - piazza Domenicani 3, Bolzano, Italy
Type of business or sector	Academic research position
Dates	April 2016 - April 2017
Position held	Reader in Applied Mathematics
Activities and responsibilities	Research, teaching, supervising,
Name and address of employer	Nottingham Trent University - Faculty of Mathematics - College of Arts and Science, Clifton Campus, Nottingham, UK
Type of business or sector	Academic research position
Dates	January 2010 - January 2016
Position held	University Assistant
Activities and responsibilities	Research, teaching, supervising
Name and address of employer	University of Groningen - Faculty of Mathematics and Natural Sciences - Johann Bernoulli Institute of Mathematics and Computing Science, Nijenborgh 9, 9747 AG Groningen, The Netherlands
Type of business or sector	Academic research position
Dates	August 2008 - December 2009
Position held	Consultant for an European Project
Activities and responsibilities	Research and development in the framework of the European project (nr 224381) *preDiCT: The Road to Real-Time Cardiac Simulations on the Next-Generation Computing Systems*

Name and address of employer	CRS4 Bioinformatics Laboratory, Edificio 3, Loc. Piscinamanna, 09010 Pula (CA) Italy
Result	Development of efficient parallel computational techniques to integrate in the cardiac simulator *Chaste* produced by Oxford University. Collaboration with Oxford University, University of Valencia, Fujitsu company, pharmaceutical companies (AUREUS Pharma, NOVARTIS, ROCHE)
Type of business or sector	Research and development
Dates	January 2005 - July 2008
Position held	Post-doctoral Researcher Fellow
Activities and responsibilities	Research and training
Name and address of employer	Karl-Franzens University of Graz, Institut of Mathematics and Scientific Computing, Heinrichstrasse, 36, A-8010 Graz, Austria
Result	Development of numerical techniques for Navier-Stokes equations in Fluid Dynamics. Collaboration with Glasgow University, and University of Basilicata, Italy
Type of business or sector	Academic research position
Dates	January 2003 - December 2004
Position held	Post-doctoral Researcher Fellow
Activities and responsibilities	Research, algorithmic development, publishing, training
Name and address of employer	CERFACS, 42, avenue G. Coriolis, 31057 Toulouse, France
Result	Development of numerical techniques for Maxwell's equations (radar-cross-section calculation) in Electromagnetics to be integrated in the industrial code *AS_ELFIP*. Collaboration with EADS company
Type of business or sector	Research and development
Dates	January 2002 - December 2002
Position held	Post-doctoral Researcher Fellow
Activities and responsibilities	Research, algorithmic development, publishing, training
Name and address of employer	University of Bari, Department of Mathematics, via E. Orabona 4, 70125 Bari, Italy
Type of business or sector	Academic research position
Dates	October 1998 - December 2001
Position held	Ph.D. fellow
Activities and responsibilities	Research finalized to obtain a Ph.D. degree
Name and address of employer	CERFACS, 42, avenue G. Coriolis, 31057 Toulouse, France
Result	Development of numerical techniques for Maxwell equations in Electromagnetics. Collaboration with EADS company
Type of business or sector	Research and development

Education and training

Dates	23 April 2002
Title of qualification awarded	Ph.D. degree
Principal subjects	Sparse preconditioners for dense linear systems from electromagnetic applications. **Keywords**: Krylov subspace methods, preconditioning techniques, sparse approximate inverse, Frobenius-norm minimization method, nonzero pattern selection strategies, electromagnetic scattering applications, boundary element method, fast multipole method
Organization providing education and training	Institut National Polytechnique de Toulouse, France

Classification	Highest grade: Léopold Escande award for the best thesis of the Institut National Politechnique of Toulouse in Computer Science of 2002
Dates	21 March 1997
Title of qualification awarded	Laurea in Mathematics (equivalent of M.Sc.)
Principal subjects	Numerical treatment of bifurcation problems. **Keywords**: Bifurcation, continuation techniques, nonlinear algebraic equations, Runge-Kutta methods for ODE's.
Organization providing education and training	University of Bari, Italy
Classification	Highest grade: Summa cum laude.

Computer skills and competences

Operating systems	Unix, Linux, Windows
Programming skills	C, C++, Fortran (77/90/95), Matlab, basics of Python, OpenMP, MPI
Mathematical libraries	BLAS, LAPACK, PETSc, HSL, SPARSKIT, SuperLU, MUMPS, ...
Scalar architectures	PCs, Workstations
Parallel architectures	Compaq Alpha Server, IBM SP, SGI Origin 2000 and O3000, CRS4 cluster of 384 quad core CPUs, Nehalem Intel processor microarchitecture, University of Groningen Millipede cluster of 252 nodes with 12/24 cores CPUs.

Professional service

Member of the scientific advisory board of the following conferences: ENUMATH'07 (Graz, 2007), Beteq'09 (Athens, 2009), Beteq'08 (Seville, 9-11th July 2008), Beteq'07 (Naple, 24-26th July2007), CEM'11 (Izmir, 2011), CEM'13 (Izmir, 2013), CEM'15 (Izmir, 2015), CEM'17 (Barcelona, 2017), CEM'18 (Stellenbosch, 2018), HPC2014 (Tampa, Florida, 2014), HPC2015 (Alexandria, Virginia, 2015), HPC2016 (Pasadena, California, 2016), HPC2017 (Virginia Beach, Virginia, 2017), HPC2018 (Baltimore, MD, USA), HPC2019 (Tucson, AZ, USA), ICBCB 2017 (Hong Kong, 2017), HPC/SmartTechCon2017 (Bengaluru, India, 2017), review team member of CSAE2019 (Sanya, China, 2019), MLIS 2019 (National Dong Hwa University, Taiwan, 2019)

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Member of the jury of the PhD thesis of Muhamad Younas (February 2012), Ivan Vujacic (July 2014), Jia Liao (November 2015)

Member of the jury of the habilitation thesis of Dr. Roland Griesse and Dr. Boris Vexler (June 2008).

Editorial Board Member of the journal *Journal of Applied Mathematics, The Scientific World Journal (Mathematical Analysis), The Open Information Systems Journal. Editorial Committee Member of Mathematical Reviews (American Mathematical Society).*

Reviewer for the following scientific journals (in alphabetical order): *Advances in Materials Science and Engineering*, *Advances in Engineering Software*, *Applied Computational Electromagnetics Society (ACES) Journal*, *Applied Mathematics and Computation*, *Applied Mathematics Letters*, *Applied Mathematical Modelling*, *Applied Numerical Mathematics*, *Applied Computational Electromagnetics Society Journal*, *BIT Numerical Mathematics*, *Computational Mechanics*, *Computers & Structures*, *Computer Methods in Applied Mechanics and Engineering*, *Computer Modeling in Engineering and Sciences*, *Computer Physics Communications*, *Computing*, *IEEE Access*,*IEEE Antennas and Wireless Propagation Letters*, *IEEE Transactions on Parallel and Distributed Systems*, *International Journal of Antennas and Propagation*, *International Journal of Computer Mathematics*, *International Journal of RF and Microwave Computer-Aided Engineering*, *Journal of Computational Physics*, *Journal of Electromagnetic Waves and Applications*, *Journal of Engineering Mathematics*, *Journal of Systems and Software*, *Mathematical and Computational Applications*, *Lecture Notes in Computer Science*, *Mathematics and Computers in Simulation*, *Mathematical and Computer Modelling*, *Mathematical Modelling and Analysis*, *Mathematical Problems in Engineering*, *Mathematical Reviews*, *Numerical Linear Algebra with Applications*, *Parallel Computing*, *Progress In Electromagnetics Research*, *Radio Science*, *Scientific Report*, *SIAM Journal of Scientific Computing*, *SIMAI Communications in Applied and Industrial Mathematics*, *Stat*, *The International Journal for Computation and Mathematics in Electrical and Electronic Engineering*, *Turkish Journal of Electrical Engineering and Computer Sciences.*

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Reviewer of book proposals for Wiley, and of project proposals for King Fahd University of Petroleum & Minerals (KFUPM).

Associate Editor for the book “Applied Mathematics" published by IntechOpen.

Grant support

The China Scholarship Council funded in 2011 a joint proposal between my group and the University of Electronic Science and Technology of China leading to a postdoc position at the JBI Institute of Mathematics and Computer Science under my independent supervision, filled by Prof. Dr. Y.F. Jing; budget €15600 ; period : October 2013 - October 2014. Subject: *Block Krylov subspace methods for solving sequences of shifted linear systems with multiple right-hand sides*.

Grant account nr ZYGX2011X018, title : *Iterative Methods and Preconditioning Techniques for Large-Scale Algebraic Systems of Linear Equations Based on Electromagnetic Scattering Problems*; program: “Fundamental Research Funds for the Central Universities"; budget : RMB 70000, €8400 ; period : July 2011 - June 2013. Participant members: Y.-F. Jing, B. Carpentieri, Y. Duan, Y. Bu, L.-J. Deng, D.-D. Chen.

Grant account nr 1112610 ; title: *Krylov Subspace Methods with Applications in Electromagnetic Scattering Computing*; program “Tianyuan Fund for Mathematics" under NSFC’s talent funding program series ; budget : RMB 30000, €3600; period : January 2012 - December 2012. Participant members: Y.-F. Jing, B. Carpentieri, Y. Bu, D.-D. Chen, L.-J. Deng.

Grant account nr 11201055 ; title: *Block Krylov Subspace Methods for Linear Systems with Multiple Right-Hand Sides in Electromagnetic Scattering*; program: “Young Scientists Fund" under NSFC’s (National Natural Science Foundation of China) talent funding program series ; budget : RMB 220000 / €26000 ; period : January 2013 - December 2015. Participant members: Y.-F. Jing, B. Carpentieri, L.-J. Deng, L. Zhao, Ze-J. Hu.

Ubbo Emmius sandwich scholarship (University of Groningen, Graduate School), funding Yiming Bu's PhD position for the period June 2013 - May 2015; budget: €40000

Ubbo Emmius sandwich scholarship (University of Groningen, Graduate School), funding Shen Zhaoli's PhD position for the period July 2014 - June 2016; budget: €40000

Ubbo Emmius sandwich scholarship (University of Groningen, Graduate School), funding Gu Xianming's PhD position for the period July 2014 - June 2016; budget: €40000

Ubbo Emmius sandwich scholarship (University of Groningen, Graduate School), funding Donglin Sun's PhD position for the period July 2015 - June 2017; budget: €40000

UniBZ grant. Innovative matrix solvers for large-scale web ranking applications (University of Bozen-Bolzano), period February 2018 - January 2021; budget: €50000

UniBZ grant. SPGAS: a Smart and Parallel Graph Analytics System (University of Bozen-Bolzano), period August 2019 - Luglio 2021; budget: €66000

UniBZ grant. Wine Identity Card (University of Bozen-Bolzano), period August 2019 - Luglio 2021; budget: €133000

Teaching in Academics

At the Faculty of Computer Science, University of Bozen-Bolzano:
- Preparatory Course Mathematics - 2017/2018/2019 Term I
- Linear Algebra - 2017/2018/2019 Term I
- Computational Mathematics - 2017/2018/2019 Term II

At the Department of Physics and Mathematics, Nottingham Trent University:
- Numerical Methods for Ordinary Differential Equations - 2016/2017 Term I
- Topics in Applied Mathematics - 2016/2017 Term II

At the Institute of Mathematics and Computing Science, University of Groningen:
- Fluid Dynamics - 2013/2014 Term IIb, 2014/2015 Term IIb
- Project Mathematical Physics - 2012/2013, 2013/2014 Term Ia, 2014/2015 Term Ia
- Computer Guided Problem Solving - 2011/2012 Term IIa
- Partial Differential Equations - 2010/2011 Term IIb, 2011/2012 Term IIa
- Computational Engineering - 2010/2011 Term IIa, 2012/2013 Term IIa
- Numerical Mathematics 1 - 2010/2011 Term Ib
- Student Colloquium Mathematics - 2009/2010 Term IIb and 2010/2011 Term IIb
- Numerical Mathematics 2 - 2009/2010 Term IIb, 2011/2012 Term IIa, 2012/2013 Term IIa, 2013/2014 Term IIa, 2014/2015 Term IIa

At the Institut of Mathemics of Karl-Franzens University, Graz, Austria:
- Proseminar Optimierung I - SS 2008
- Proseminar Einführung in die Numerische Mathematik - SS 2008
- Proseminar Lineare Algebra I - WS 2007/08
- Proseminar Numerische Mathematik II - WS 2007/08

- Proseminar Angewandte Stochastik - WS 2007/08
- Proseminar Numerische Mathematik für LehramtskandidatInnen - SS 2007
- Proseminar Numerische Mathematik I - SS 2007
- Proseminar Optimierung I - SS 2006
- Proseminar Numerische Mathematik II - SS 2006
- Programmierung (C++) - WS 2005/06
- Proseminar Numerische Mathematik I - WS 2005/06

Numerical Linear Algebra for High-Performance Computers - Summer School on Mathematical Techniques in Modeling Physiological Systems (Sarajevo, 10 - 22 September 2006)

Students

PhD Thesis 2018-2022	Sehar Naveed: Block Krylov methods for solving multiple right-hand sides linear systems
PhD Thesis 2015-2018	Donglin Sun: Numerical linear algebra methods for nanophotonic applications
BSc Thesis 2017	Hasan Evliya: Mathematical applications in business and finance
BSc Thesis 2017	James Siakwang: Supply and demand microeconomics model
BSc Thesis 2017	Dan Greenhill: Portfolio model in MATLAB
BSc Thesis 2017	Daniel Lever: Growth model and neural nets in Excel
Honour Thesis 2015	Irina Chiscop: An epidemic model of influenza and other diseases
BSc Thesis 2015	Rik Ledoux: Understanding the dynamics of wind-driven ocean circulation
BSc Thesis 2015	Teun Verstraaten: Pushing the boundaries: fast integral methods for solving boundary element equations
BSc Thesis 2015	David Langbroek: The Google PageRank problem, and beyond
BSc Thesis 2014	Harmen Stoppels: Closer to the solution: restarted GMRES with adaptive preconditioning
MSc Thesis 2013	Sven Baars: Block and Conquer: Exploiting block structures to improve the performance of multilevel incomplete factorization preconditioning
Postdoc 2013	Yan-Fei Jing: Iterative krylov subspace methods
BSc Thesis 2013	Koen van Geffen: Sparse approximate inverse methods
PhD Thesis 2014-2017	Shen Zhaoli: Distributed Schur complement preconditioners for sparse linear systems
PhD Thesis 2014-2017	Gu Xianming: Multilevel preconditioners for dense linear systems in Computational Electromagetics
PhD Thesis 2013-2016	Yiming Bu: Matrix factorization methods for Markov chains and for iterative solution of systems of linear equations
PhD Thesis 2011-2015	Jao Liao: VBARMS: A variable block algebraic recursive multilevel solver for sparse linear systems
BSc Thesis 2012	Gideon Vos: Energy Transfer in Light-Harvesting Complexes
BSc Thesis 2012	Christian Douma: Calculation of Electromagnetic Fields Irradiated by Proton Beams in the Human Body
BSc Thesis 2011	Sven Baars: Variants of the Lanczos Method for Iterative Solutions of Nonsymmetric Linear Systems
MSc Thesis 2010	Ruò Meí Hu: Voice Producing Element

Professionalization

Basic Teaching Qualification Skills course (University of Groningen, Donald Smits Center for Information Technology, Educational Support and Innovation, 2011)

Supervising thesis students course (University of Groningen, Donald Smits Center for Information Technology, Educational Support and Innovation, 2011)

Coaching PhD student course (University of Groningen, HR-Experts - Human Resources, 2012)

Academic leadership course (University of Groningen, HR-Experts - Human Resources, 2013)

Cultural Awareness in Teaching & Learning course (University of Groningen , Donald Smits Center for Information Technology, Educational Support and Innovation, 2013)

International Classroom seminar (University of Groningen, 2013)

University Teaching Qualification (BKO, University of Groningen, Donald Smits Center for Information Technology, Educational Support and Innovation, 2013, Supervisor: Dr. Gabriëlle Visser)

Staff Support Session - Being a module leader, 2016, (Nottingham Trent University)

Staff Support Session: Grant application: help with writing a case for support, 2017, (Nottingham Trent University)

Staff Support Session Group work and Oral presentations, 2017, (Nottingham Trent University)

Awards

2018 *Teaching award* - Best Teacher 2017. Faculty of Computer Science. University of Bozen-Bolzano.

2013 *Teaching award* - Best Propedeutic Project. Faculty of Mathematics and Physics. University of Groningen.

2013 *Teaching award* - Nomination for the Teaching of the Year Election in Mathematics. University of Groningen.

2009 *Conference award* - 2nd prize for outstanding research paper at the 11th Chinese Computational Mathematics Annual Meeting, Guiyang, China, July 20-23, 2009.

2006 *Conference award* - Best mathematical presentations at the IABEM'06 conference, 10-12 July 2006.

2003 *Léopold Escande* - Best thesis of the Institut National Politechnique de Toulouse in Computer Science of 2002.

1997 *Summa cum laude* - B. S. mention, University of Bari.

1988 *Alfiere del Lavoro* - Presidential award for performance excellence study.

1988 *Rotary award* - Performance excellence study.

Personal skills

Mother tongue **Italian**

Other language(s)

	Listening	*Reading*	*Spoken*	*Writing*
English	Very good	Very good	Very good	Very good
French	Very good	Very good	Very good	Good
German	Basic	Basic	Basic	Basic

Dutch*	Niveau 2*	Niveau 2*	Niveau 2*	Niveau 2*

$(*)$ Niveau 3 and 4 are scheduled this year

Memberships

GNCS (1998-2007), SIAM (1998-2002), SMAI (2002-2004)