Dossier

Contents

1 Personal Data

Name	:	Massimo
Family name	:	Fornasier
Birthday	:	July 6 1975
Place of birth	:	Feltre (BL), Italy
Marital status	:	single, no kids
Academic titles	:	Prof. Dott. Ric. Dott.
Citizenship	:	Italian

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Full Professor (W3- Leuchtturm-Professur), Chair in Applied Numerical Analysis
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Also leader of the START project “Sparse Approximation and Optimization in High-Dimensions”
at the Johann Radon Institute (RICAM), Linz, AUSTRIA
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2 Presentation

2.1 Academic career in short

I was a doctoral student in Computational Mathematics at the University of Padua in Italy (1999-2002), under the joint supervision of Prof. Hans G. Feichtinger (Institute for Mathematics, University of Vienna, Austria) and Prof. Maria Morandi Cecchi (Department of Pure and Applied Mathematics, University of Padua, Italy). In the period 1998-2004 I was co-author together with Prof. Domenico Toniolo (Department of Physics "Galileo Galilei") and scientific responsible of the Mantegna Project, i.e., the complete (mathematics based and computer assisted) restoration of the famous Andrea Mantegnas frescoes in Padua (Italy) destroyed by a bombing in World War II[1]. I was awarded a scientific prize by the University of Padua for "A scientific work on the computer restoration of the fragments of the art frescoes in the Eremitani's Church in Padua". After the doctoral studies, I joined the EU-Research Training Network HASSIP (Harmonic Analysis and Statistics for Signal and Image Processing HPRN-CT-2002-00285), with PostDoc positions at the University of Vienna, Austria, University of Bremen, and University of Marburg, Germany (2003-2004). Later I obtained an Intra-European Individual Marie Curie Fellowship, project *Flexible Time-Frequency Decompositions and Adaptive Treatment of Operator Equations by Frames* (FTFDORF), at the University of Vienna (2004-2006). During the period 2003-2006 I also cooperated with the University of Rome "La Sapienza" on the basis of a local research grant. I joined RICAM (the Johann Radon Institute for Computational and Applied Mathematics, Austrian Academy of Sciences, Linz, Austria) in June 2006 and, with an unpaid leave of one year, I started in Oct. 2006 a cooperation within the Program in Applied and Computational Mathematics (PACM), Princeton University, U.S.A., on the basis of a second individual project *Sparse Approximation for Blind Source Separation* (SPARSE), an Outgoing International Marie Curie Fellowship. A further major project was approved in Nov. 2006: WWTF "Five Senses - Call 2006", *Mathematical Methods for Image Analysis and Processing in Visual Arts*. In October 2007, I returned to RICAM. In June 2008 I obtained the Habilitation (venia docendi) at the University of Vienna. In September 2008 I received a call for a W1 (junior) Professorship in Numerical Fourier Analysis from the University of Rostock (Germany), later declined. In November 2008 I have been awarded the START-Preis of the Fonds zur Förderung der wissenschaftlichen Forschung, Austria for the project "Sparse Approximation and Optimization in High Dimensions". Since January 2009 until March 2011 I was co-leader of the group of Analysis of PDEs at RICAM, and since April 2009 I'm coordinating the research team of the START project. In April 2009 I have been awarded the scientific prize "Prix de Boelpaepe" of the Royal Academy of Sciences of Belgium for my work in mathematical imaging. In the period October-November 2009 I covered an invited visiting position at the Texas A&M University in College Station, Texas, U.S.A. On February 26 2010 I received a call for a W2 Professorship in Numerics for Partial Differential Equations/Scientific Computing from the University of Bonn (Germany), later declined. On April 14 2010 I received the "Best Paper Award" of the Austrian Academy of Sciences. On April 14 2010 my position at RICAM was made permanent. In the period March-May 2010 I was covering a visiting Professor position at the University of Vienna (Austria). In July 2010 I have been granted a Heisenberg Professorship from the Deutsche Forschungsgemeinschaft (DFG) in Germany[2]. This Programme is a start-up co-financing for a Chair in Numerical Analysis at the Philipps-University of Marburg in Germany. On January 25, 2011 I received a direct call from the President of the Technical University of Munich (TUM) for a W3 Leuchtturm-Professur, to cover a Chair in Applied Numerical Analysis, which I accepted on January 26, 2011, declining at the same time the call from Marburg. Since April 1, 2011 I'm serving at the TUM, mantaining a Scientific Advisor position at RICAM, currently limited at June 2012, for the conclusion of the START project.

[1] http://www.progettomantegna.it

[2] http://www.dfg.de/en/research_funding/programmes/individual/heisenberg/in_brief/index.html

3 Curriculum Vitae

3.1 Education and academic degrees

Habilitation (venia docendi)
Habilitationsschrift title: *Compressive Algorithms. Adaptive Solutions of PDEs and Variational Problems*
Faculty of Mathematics,
University of Vienna, Austria
June 4, 2008

Doctoral degree in Computational Mathematics
Dissertation Title: *Constructive Methods for Numerical Applications in Signal Processing and Homogenization Problems*
no grades are provided in Italy
University of Padua (Italy), February 17 2003
Advisors: Prof. Dr. Hans Georg Feichtinger, Prof. Dr. Maria Morandi Cecchi

Graduate Programme in Computational Mathematics
University of Padua, Italy
Nov. 1999 – Dec. 2002

Laurea in Mathematics
Graduated *Magna cum Laude*
University of Padua, Italy
October 28 1999

Studies in Mathematics
University of Padua, Italy
Nov. 1994 – Oct. 1999

3.2 Academic positions

Full Professor in Applied Numerical Analysis
Faculty of Mathematics
Technical University of Munich, Germany.
April 2011 –

Visiting Professor
Faculty of Mathematics
University of Vienna, Austria.
March – May 2010

Visiting Scholar
Department of Mathematics
Texas A&M University, U.S.A.,
October – December 2009

Leader of the FWF START-Project
“Sparse Approximation and Optimization in High-Dimensions”

Johann Radon Institute for Computational and Applied Mathematics
Austrian Academy of Sciences, Austria.
April 2009 – March 2015

Leader of the Group of Analysis of Partial Differential Equations
(jointly with Peter A. Markowich) Johann Radon Institute for Computational and Applied Mathematics
Austrian Academy of Sciences, Austria.
January 2009 – March 2011

Senior Research Scientist
(tenured position since April 2010)
Johann Radon Institute for Computational and Applied Mathematics
Austrian Academy of Sciences, Austria.
June 2006 – March 2011

Research Associate
Program in Applied and Computational Mathematics
Princeton University, U.S.A.
October 2006 – October 2007

Individual Marie Curie Fellow
Faculty of Mathematics
University of Vienna, Austria
May 2004 – April 2006

Research Assistant
Department of Mathematical Methods and Models for Applied Sciences
University of Rome “La Sapienza”, Italy
June 2003 – May 2006

Research Assistant (Marie Curie Fellow)
EU-network RTN HASSIP (Harmonic Analysis and Statistics for
Signal and Image Processing, contract HPRN-CT-2002-00285)
Faculty of Mathematics
University of Vienna, Austria
January 2004 – April 2004

Research Assistant (Marie Curie Fellow)
EU-network RTN HASSIP (Harmonic Analysis and Statistics for
Signal and Image Processing, contract HPRN-CT-2002-00285)
AG Numerik/Wavelet Analysis Group – Zentrum für TechnoMathematik
University of Marburg and University of Bremen, Germany
July 2003 – December 2003

Research Assistant (Marie Curie Fellow)
EU-network RTN HASSIP (Harmonic Analysis and Statistics for
Signal and Image Processing, contract HPRN-CT-2002-00285)
Faculty of Mathematics
University of Vienna, Austria
May 2003 – June 2003

Research Assistant (Österreich-Stipendium/Austrian Scholarship)
Faculty of Mathematics

University of Vienna, Austria
November 2002 – April 2003

Doctoral student Graduate Program in Computational Mathematics
University of Padua, Italy
November 1999 – October 2002

3.3 Other invited research visits

Department of Mathematics
Rutgers University, U.S.A.
Sept. 28-30, 2011

Department of Mathematics
Duke University, U.S.A.
Sept. 24-28, 2011

Max-Planck Institute for Mathematical Sciences
Leipzig, Germany
June 22-24 2009

Department of Mathematics and Scientific Computing
University of Graz, Austria,
Feb. 26-28 2009

Institute for Numerical Simulation
University of Bonn, Germany,
Feb. 8-13 2009

Program in Applied and Computational Mathematics
Princeton University, U.S.A.
Oct. 15-27, 2008, Oct.-Dec. 2009

Department of Mathematics
University of Pavia, Italy
May 21-22, Nov. 23-26 2008

School of Mathematics
University of Edinburgh, UK
Feb. 27 - Mar. 5 2008

Department of Applied Mathematics and Theoretical Physics
Center of Mathematical Sciences
Cambridge University, UK
Nov. 21-30 2007, Mar. 6-12, Nov. 17-23 2008, April 19-23 2009

Courant Institute of Mathematical Sciences
New York University, U.S.A.
Feb. 6-8,12,19-20,22,27, Mar. 21, Apr. 27,30, May 22 2007.

AG Numerik/Wavelet-Analysis Group,
Fachbereich Mathematik und Informatik der
Philipps-Universitaet Marburg, Germany

Mar .8-12 2004, Jun. 23-26 2004, Aug. 16-27 2004,
Mar. 6-16 2005, Jan. 16-20 2006, Sept. 24-20 2006,
Mar. 23-30 2008, Aug. 18-29 2008, Aug. 7-14 2009.

3.4 Other contracts and cooperations

Consulting contract (project: FWF Operatoren fuer Zeit-Frequenz Analysis)
Faculty of Mathematics
University of Vienna, Austria
November 2002 – April 2003

Cooperation pro bono publico (Mantegna Project)
Conception and realization of the Mantegna Project, the mathematical and computer assisted restoration of Mantegnas art frescoes in the Eremitani Church in Padua (www.progettomantegna.it)
Mantegna Project Lab.
University of Padua, Italy
Dec. 1999 – present time

3.5 Individual honors and awards

c.a. **210 citations** on Mathematical Reviews and c.a. **960 citations** on Google Scholar, October 2011

Leuchtturm Professur (Lighthouse Professorship), Technical University of Munich, Germany 2011.

Heisenberg Professorship (Deutsche Forschungsgemeinschaft), a start-up co-financing for a Chair in Numerical Analysis at the Philipps-University of Marburg in Germany, 2010

Best Paper Award (Jubiläumsfonds der Stadt Wien für die ÖAW 2009) for the paper *Iteratively reweighted least squares minimization for sparse recovery* (with I. Daubechies, R. DeVore, C. S. Güntürk), Commun. Pure Appl. Math., Vol. 63, no. 1, 2010, pp. 1-38

Scientific prize "Prix de Boelpaepe" of the Académie Royale de Belgique – Classe des Sciences, April 4 2009
`http://www.ricam.oeaw.ac.at/people/page/fornasier/PrixDeBoelpaepe.pdf`
`http://www2.academieroyale.be/academie/documents/CONCOURSPRIXETSUBVENTIONSInformati697.pdf`

The paper *Restoration of color images by vector valued BV functions and variational calculus* (with R. March), SIAM J. Appl. Math., Vol. 68 No. 2, 2007, pp. 437-460 is used by SIAM (Society for Industrial and Applied Mathematics in the U.S.A.) as a relevant example of applicable mathematics:
`http://www.siam.org/publicawareness/images.php`

FWF-START award 2008 for the project "Sparse Approximation and Optimization in High-Dimensions" (`http://www.fwf.ac.at/de/public_relations/press/pa20081110.html`)

Finalist (among the best 4 candidates) for the scientific prize "Young researchers in Mathematics competition", University of Padua, 2007
(`http://www.ricam.oeaw.ac.at/people/page/fornasier/finalPD.pdf`)

Scientific prize for "A scientific work on the computer restoration of the fragments of the art frescoes in the Eremitanis Church in Padua", University of Padua, Italy, 1999

Marie Curie Outgoing International Fellowship (contract MOIF-CT-2006-039438, 18 months) of the European Commission (6th Framework Programme) project "Sparse Approximation for Blind Source Separation", 2006

Individual Marie Curie Fellowship (contract MEIF-CT-2004-501018, 2 years) of the European Commission (6th Framework Programme) project "Flexible Time-Frequency Decompositions and Adaptive Treatment of Operator Equations by Frames", 2004

Research fellowship (assegno di ricerca, 3 years) "Wavelets and frames in approximation theory", University of Rome "La Sapienza", Italy, 2003

Austrian scholarship (Österreich-Stipendium, 6 months) of the Federal Ministry for Education, Science, and Culture (BMBWK) via ÖAD (Österreichischer Austauschdienst) and the Ministero degli Esteri Italiano (the Italian Ministry of Foreign Affairs), Austria, 2002

Doctoral Studies Scholarship (3 years) of the University of Padua, Italy, 1999

3.6 Recent offers for Professorships at international Universities

Offer for a W3-professor position for a Chair in Applied Numerical Analysis at the Technical University of Munich, Germany, 2011 (accepted)

Heisenberg Professorship for a Chair in Numerical Analysis and Computational Harmonic Analysis at the Philipps-University of Marburg, Germany, 2010 (declined)

Offer for a W2-professor position in Scientific Computing/Numerical Simulation at the University of Bonn, Germany, 2010 (declined)

Visiting Professor position at the University of Vienna, Austria, 2010

Visiting Professor position at the University of Provence in Marseille, France, 2010 (declined)

Offer for a W1-professor position in Numerical Fourier Analysis at the University of Rostock, Germany, 2008 (declined)

3.7 Other considered positions

Short-listed for a W3-professor position in Applied Mathematics, University of Göttingen, Germany 2009

Short-listed for a W3-professor position in Numerical Analysis at the Technical University of Munich, Germany, 2009

Short-listed for an Associate Professor position at the Centre of Mathematics for Applications, University of Oslo, Norway, 2009

Short-listed for a W2-professor position in Applied Mathematics at the University of Regensburg, Germany, 2009

Short-listed for a W2-professor position in Numerical Analysis at the Rheinisch-Westfaelische Technische Hochschule Aachen (RWTH-A), Germany, 2009

Short-listed for an Assistant Professor position at the Faculty of Electrical Engineering, Ecole Polytechnique Federale de Lausanne (EPFL), Switzerland, 2009

Short-listed for a W2-professor position in Numerical Analysis at the University of Bonn, Germany, 2008

Short-listed for a Faculty position at the Faculty of Mathematics, Ecole Polytechnique Federal de Lausanne (EPFL), Switzerland, 2008

Short-listed for a Full Professorship position in Applied Mathematics, ETH-Zurich, Seminar in Applied Mathematics, Switzerland, April 2010

Short-listed for a Full Professorship position in Computational Mathematics, University of Basel, Switzerland 2009

Invited for an Associate Professor position in Numerical Analysis at the University of Rome "Tor Vergata", Italy, 2010 (declined)

Invited to the interview for a W3-Professor position in Mathematical Image Processing at the University of Keiserslautern, Germany, 2009

Invited to the interview for a W2-Professor position in Applied Mathematics at the Ludwig-Maximilians University of Munich, Germany, 2009 (declined)

Invited to the interview for a W1-Professor position in Scientific Computing at the University of Heidelberg, Germany, 2008 (declined)

3.8 Research publications

Scientifc production	:	Dissertations	: 3
	:	Papers in refereed journals	: 34
	:	Submitted papers	: 3
	:	Papers in proceedings	: 10
	:	Book chapters	: 5
	:	Books	: 1
	:	Lecture notes	: 1
	:	Internal manuscripts	: 3

3.8.1 Submitted preprints to refereed journals

1. *Learning functions of few arbitrary linear parameters in high dimensions* (with K. Schnass and J. Vybiral), submitted to Found. Comput. Math., August 2010, 31 pp.

2. *Existence of minimizers of the Mumford and Shah functional with singular operators in two space dimensions* (with R. March and F. Solombrino), submitted to Ann. Mat. Pura Appl., May 2011, 26 pp.

3. *Wavelet decomposition method for L_2/TV-image deblurring* (with Y. Kim, A. Langer, C.-B. Schoenlieb), submitted to SIAM J. Imag. Sci., January 2011, 19 pp.

3.8.2 Refereed journal papers

4. *Particle systems and kinetic equations modeling interacting agents in high dimension* (with J. Haskovec and J. Vybiral), to appear in SIAM J. Multiscale Modeling and Simulation.

5. *Low rank matrix recovery via iteratively reweighted least squares minimization* (with H. Rauhut and R. Ward), to appear in SIAM J. Optim.

6. *Multilevel preconditioning and adaptive sparse solution of inverse problems* (with S. Dahlke and T. Raasch), to appear in Math. Comput.

7. *Fluid dynamic description of flocking via Povzner-Boltzmann equation* (with J. Haskovec and G. Toscani), Physica D (nonlinear phenomena), Vol. 240, no. 1, 2011, pp. 21-31

8. *A convergent overlapping domain decomposition method for total variation minimization* (with A. Langer and C.-B. Schönlieb), Numer. Math., Vol. 116, no. 4, 2010, pp. 645-685

9. *A kinetic flocking model with diffusion* (with R. Duan and G. Toscani), Commun. Math. Phys., Vol. 300, no. 1, 2010, pp. 95-145

10. *Asymptotic flocking dynamics for the kinetic Cucker-Smale model* (with J. A. Carrillo, J. Rosado, and G. Toscani), SIAM J. Math. Anal., Vol. 42, no. 1, 2010, pp. 218-236

11. *Iterative thresholding meets free-discontinuity problems* (with R. Ward), Found. Comput. Math., Vol. 10, no. 5, 2010, pp. 527-567

12. *Subspace correction methods for total variation and ℓ_1-minimization,* (with C.-B. Schönlieb), SIAM J. Numer. Anal., Vol. 47, no. 5, 2009, pp. 3397-3428

13. *Optimal adaptive computation in the Jaffard algebra and localized frames* (with S. Dahlke and K. Gröchenig), J. Approx. Theory, Vol. 162, no. 1, 2010, pp. 153-185.

14. *Iteratively re-weighted least squares minimization for sparse recovery* (with I. Daubechies, R. DeVore, C. S. Güntürk), Commun. Pure Appl. Math., Vol. 63, no. 1, 2010, pp. 1-38

15. *The application of joint sparsity and total variation minimization algorithms to a real-life art restoration problem* (with R. Ramlau and G. Teschke), Adv. Comput. Math., Vol. 31, Nos 1-3, 2009, pp. 301-329.

16. *Nonlinear and adaptive frame approximation schemes for elliptic PDEs: theory and numerical experiments* (with S. Dahlke, M. Primbs, T. Raasch, M. Werner), Numerical Methods for Partial Differential Equations, Vol. 25, no. 6 ,2009, pp. 1366-1401

17. *Iterative thresholding algorithms* (with H. Rauhut), Appl. Comput. Harmon. Anal., Vol. 25, No. 2,2008, pp. 187-208.

18. *Adaptive frame methods for nonlinear variational problems* (with M. Charina and C. Conti), Numer. Math., Vol. 109 No. 1, 2008, pp. 45-75.

19. *Domain decomposition methods for linear inverse problems with sparsity constraints,* Inverse Problems, Vol. 23, No. 6, 2007, pp. 2505-2526.

20. *Accelerated projected gradient method for linear inverse problems with sparsity constraints* (with I. Daubechies and I. Loris), J. Fourier Anal. Appl., Vol. 14, No. 5-6, 2008, pp. 764-792.

21. *Recovery algorithms for vector valued data with joint sparsity constraints* (with H. Rauhut), SIAM J. Numer. Anal., vol. 46, No. 2, 2008, pp. 577-613.

22. *Restoration of color images by vector valued BV functions and variational calculus* (with R. March), SIAM J. Appl. Math., Vol. 68 No. 2, 2007, pp. 437-460.

23. *Adaptive iterative thresholding algorithms for magnetoencephalography (MEG)* (with F. Pitolli), J. Comput. Appl. Math., Vol. 221 No. 2, 2008, pp. 386-395

24. *Sampling theorems on bounded domains* (with L. Gori), J. Comput. Appl. Math., Vol. 221 No. 2, 2008, pp. 376-385.

25. *Generalized coorbit theory, Banach frames, and the relation to α-modulation spaces* (with S. Dahlke, H. Rauhut, G. Steidl, and G. Teschke), Proc. London Math. Soc., Vol. 6 No. 2, 2008, pp. 464-506.

26. *Adaptive frame methods for elliptic operator equations: the steepest descent approach* (with S. Dahlke, T. Raasch, R. Stevenson and M. Werner), IMA J. Numer. Anal., Vol. 27 No. 4, 2007, pp. 717-740

27. *Banach frames for α-modulation spaces,* Appl. Comp. Harmon. Anal., Vol. 22, No. 2, 2007, pp. 157-175.

28. *Adaptive frame methods for elliptic operator equations,* (with S. Dahlke and T. Raasch) Adv. Comp. Math., Vol. 27 No. 1, 2007, pp. 2763

29. *On some stability results of localized atomic decompositions,* Rend. Mat. Appl., No. 26, 2006, pp. 315-325.

30. *Nonlinear projection recovery in digital inpainting for color image restoration*, J. Math. Imaging Vis. Vol. 24, No. 3, 2006, pp. 359-373.

31. *Flexible Gabor-wavelet atomic decompositions for L^2 Sobolev spaces* (with H. G. Feichtinger), Ann. Mat. Pura Appl. Vol. 185(4), No. 1, 2006, pp. 105-131.

32. *Continuous frames, function spaces, and the discretization problem* (with H. Rauhut), J. Fourier Anal. Appl., Vol. 11, No. 3, 2005, pp. 245-287.

33. *Intrinsic localization of frames* (with K. Gröchenig), Constr. Approx., Vol. 22, No. 3, 2005, pp. 395-415.

34. *Fast homogenization algorithm based on asymptotic theory and multiscale schemes* (with M. Morandi Cecchi), Numer. Algorithms, Vol. 40, No. 2, 2005, pp. 171-186

35. *Fast, robust, and efficient 2D pattern recognition for re-assembling fragmented images* (with D. Toniolo), Pattern Recognition, Vol. 38, No. 11, 2005, pp. 2074-2087.

36. *Quasi-orthogonal decompositions of structured frames*, J. Math. Anal. Appl. Vol. 289, No. 1, 2004, pp. 180-199.

37. *Function spaces inclusions and rate of convergence of Riemann-type sums in numerical integration*, Numer. Funct. Anal. Opt., Vol. 24, Nos. 1 & 2, 2003, pp. 45-57.

3.8.3 Conference papers

38. *Mathematical methods for spectral image reconstruction* (with W. Baatz and J. Haskovec), Proceedings of the workshop Scientific Computing for Cultural Heritage, Heidelberg Germany, November 2009.

39. *Binary based fresco restoration* (with W. Baatz, P. Markowich, and C.-B. Schnlieb), Proceedings of the conference Bridge 2009: Mathematics, Music, Art, Architecture, Culture, pp. 337-338

40. *Compressive Algorithms. Adaptive Solutions of PDE's and Variational Problems*, invited lecture for the IMA Mathematics of Surfaces XIII conference, 2009

41. *Electric current density imaging via an accelerated iterative algorithm with joint sparsity constraints* (with G. Bretti and F. Pitolli), SPARS'09 - Signal Processing with Adaptive Sparse Structured Representations (2009)

42. *Domain decomposition methods for compressed sensing* (with A. Langer and C.-B. Schönlieb), Proc. Int. Conf. SampTA09, Marseilles, 2009

43. *Mathematics enters the picture*, Proceedings of the workshop MathKnow 2008, Springer, 2009

44. *Iteratively re-weighted least squares minimization: proof of faster than linear rate for sparse recovery* (with I. Daubechies, R. DeVore, and C. S. Güntürk), Information Sciences and Systems, 2008. CISS 2008. 42nd Annual Conference, pp. 26-29

45. *Inpainting of ancient Austrian frescoes* (with W. Baatz, C.-B. Schönlieb, and P. Markowich), Conference proceedings of Bridges 2008, Leeuwarden 2008, pp.150-156.

46. *Faithful recovery of vector valued functions from incomplete data. Recolorization and art restoration*, Lecture Notes in Computer Science, Volume 4485/2007, Proceedings of the First International Conference on Scale Space Methods and Variational Methods in Computer Vision (Sgallari, Fiorella; Murli, Almerico; Paragios, Nikos Eds.), 2007, pp. 116-127.

47. *On elementary sampling theorems on bounded domains* (with L. Gori), Proc. Int. Conf. ICNAAM 2005 (Ed. Simos Theodore S. et al.), Weinheim: Wiley-VHC, pp. 619-623.

48. *Building a bridge between Gabor and wavelet worlds*, Mini-Workshop: Wavelets and Frames, Feb. 15-21 2004, Oberwolfach Reports, 1(1), 2004, pp. 490-494.

49. *Decompositions of Hilbert spaces: local construction of global frames*, Proc. Int. Conf. Constructive Function theory 2002, Varna, DARBA, Sofia, 2003, pp. 275-281.

3.8.4 Book chapters

50. *Particle, Kinetic, Hydrodynamic Models of Swarming* (with J. A. Carrillo, G. Toscani, and F. Vecil), within the book "Mathematical modeling of collective behavior in socio-economic and life-sciences", Birkhäuser (in preparation, Eds. Lorenzo Pareschi, Giovanni Naldi, and Giuseppe Toscani), 2010, 34 pp.

51. *Numerical Methods for Sparse Recovery* within the book "Theoretical Foundations and Numerical Methods for Sparse Recovery", Radon Series in Applied and Computational Mathematics, de Gruyter (Ed. Massimo Fornasier), 2010, 110 pp.

52. *Compressive Sensing* (with Holger Rauhut) in the "Handbook of Mathematical Methods in Imaging", Springer 2010 (`http://refworks.springer.com/mrw/index.php?id=2420`)

53. *Il Progetto Mantegna: storia e risultati* (Italian) (with R. Cazzato, G. Costa, A. Dal Farra, D. Toniolo, D. Tosato, C. Zanuso), in Andrea Mantegna. La Cappella Ovetari a Padova (Anna Maria Spiazzi, Alberta De Nicolò Salmazo, Domenico Toniolo eds.), Skira, 2006.

54. *Computer-based re-composition of the frescoes in the Ovetari Chapel in the Church of the Eremitani in Padua. Methodology and initial results*, (Italian/English) (with D. Toniolo), in "Mantegna nella chiesa degli Eremitani a Padova. Il recupero possibile" Ed. Skira, May 2003, pp. 15-23.

3.8.5 Books

55. *Theoretical Foundations and Numerical Methods for Sparse Recovery*, Radon Series in Applied and Computational Mathematics, de Gruyter, July 2010
(`http://www.degruyter.de/cont/fb/ma/detail.cfm?isbn=9783110226140&sel=pi`)

3.8.6 Dissertations

56. *Compressive Algorithms. Adaptive Solutions of PDE's and Variational Problems*, Habilitationsschrift, Faculty of Mathematics, University of Vienna, January 7, 2008, 426 pp.

57. *Constructive Methods for Numerical Applications in Signal Processing and Homogenization Problems*, doctoral thesis, University of Padua, Dec. 2002.

58. *Un metodo per la rappresentazione e il confronto di immagini a meno di rotazioni. Un contributo alla ricostruzione virtuale degli affreschi della Chiesa degli Eremitani in Padova* (Italian), Laurea thesis, Department of Pure and Applied Mathematics, University of Padua, Oct. 1999.

3.8.7 Lecture notes

59. *Introduzione all'analisi armonica numerica* (Italian), Lecture Notes, 2007 112 pp.

3.8.8 Miscellaneous

60. *Proposta per una anastilosi informatica degli affreschi della Capella Ovetari nella Chiesa degli Eremitani in Padova* (Italian) (with C. Fanin and D. Toniolo), technical report DFPD 02/EI/31, Department of Physics "G. Galilei", University of Padua.

61. *Compactly supported circular harmonics: fast, robust and efficient 2D pattern recognition*, (with D. Toniolo), technical report DFPD 02/EI/32, Department of Physics "G. Galilei", University of Padua.

62. *Una discussione matematica sulla rappresentazione ed il confronto di immagini a meno di rotazioni. Un contributo alla ricostruzione informatica degli affreschi nella Chiesa degli Eremitani in Padova* (Italian), technical report DFPD 99/EI/24, Department of Physics "G. Galilei", University of Padua.

3.9 Oral presentations

3.9.1 Plenary lectures

1. Plenary speaker at "Mathematics and Image Analysis 2012", Institut Henri Poincaré, Paris, France, 16-18 January 2012

2. Compressive algorithms. Adaptive solutions of PDE's and variational problems, Int. Conf. Surfaces XIII, University of York, UK, September 7-9, 2009.

3. Compressive algorithms. Multilevel preconditioning and convergence rates, Int. Conf. Modern Methods of Time-Frequency Analysis, Strobl, Austria, June 15-20, 2009.

4. Variational principles and compressive algorithms, Int. Conf. "Mathematical Methods for Curves and Surfaces", Toensberg, Norway, June 26-July 1, 2008.

5. Mathematical imaging and visual art restoration, "SCCH 2007: Scientific Computing and the Cultural Heritage IWR Workshop", Heidelberger Akademie der Wissenschaften, Heidelberg, Germany, November 12-14, 2007.

3.9.2 Colloquia

6. Compression, adaptivity, multiscale, and decompositions in the numerical solutions of Partial Differential Equations, Department of Mathematics, University of Klagenfurt, Apr. 8 2011

7. Compression, adaptivity, multiscale, and decompositions in the numerical solutions of Partial Differential Equations, Department of Mathematics, University of Heidelberg, Jan. 27 2011

8. Compression, adaptivity, multiscale, and decompositions in the numerical solutions of Partial Differential Equations, Faculty of Mathematics, University of Vienna, Oct. 7, 2010

9. Mathematics Enters the Picture. (The restoration of the Mantegna's frescoes in Padua), Kunsthistorische Gesellschaft, Institut für Kunstgeschichte , University of Vienna, May 26, 2010.

10. Compressed numerical methods for well-posed and degenerate elliptic PDEs, Department of Mathematics, Technical University of Munich, May 20, 2010

11. Innovative Sparse Recovery Methods for PDEs, Mathematical Colloquium, Department of Mathematics, University of Osnabrück, May 12, 2010

12. Compressed numerical methods for well-posed and degenerate elliptic PDEs, Seminar for Applied Mathematics, ETH-Zürich, April 12, 2010

13. Compressed numerical methods for well-posed and degenerate elliptic PDEs, Department of Mathematics, University of Basel, November 19 2009

14. Compressed numerical methods for well-posed and degenerate elliptic PDEs, Institut für Numerische und Angewandte Mathematik, University of Göttingen, October 31 2009

15. Compressed numerical methods for well-posed and degenerate elliptic PDEs, Institute for Numerical Simulation, University of Bonn, October 29, 2009

16. Sparse approximation and optimization in high dimensions, Max Planck Institute for Mathematics in the Sciences, Leipzig, Germany, June 23, 2009.

17. Compressive Algorithms. Adaptive Solutions of PDEs and Variational Problems, Department of Mathematics and Computer Sciences, Technical University of Munich, Germany, June 2 2009.

18. Sparse Approximation and Optimization in High Dimensions, Faculty of Mathematics, University of Vienna, Austria, May 13 2009.

19. Compressive Algorithms. Adaptive Solutions of PDEs and Variational Problems, Center of Mathematics for Applications, University of Oslo, Norway, Apr. 16. 2009.

20. Innovative theories, methods, and applications in signal and image processing, IDIAP-EPFL, Lausanne, Switzerland, March 18, 2009

21. Variational principles and compressive algorithms, Department of Mathematics, University of Regensburg, Germany, October 1, 2008.

22. Compressive Algorithms. Adaptive Solutions of PDEs and Variational Problems, Seminar for Applied Mathematics, ETH-Zurich, Dec. 17. 2008.

23. Compressive Algorithms. Adaptive Solutions of PDEs and Variational Problems, Department of Mathematics, University of Leeds, UK, June 19, 2008.

24. Compressive Algorithms. Adaptive Solutions of PDEs and Variational Problems, Department of Mathematics, University of Rostock, Germany, June 18, 2008.

25. Compressive Algorithms. Adaptive Solutions of PDEs and Variational Problems, Habilitationskolloquium, Faculty of Mathematics, University of Vienna, Austria, June 4 2008.

26. Faithful recovery of vector valued functions from incomplete data. Recolorization and art restoration, Colloquium, Institut für Numerische und Angewandte Mathematik (NAM), Georg-August-Universität Göttingen, Göttingen, Germany, Dec. 19 2006.

27. Faithful recovery of vector valued functions from incomplete data. Recolorization and art restoration, Colloquium, Program in Applied and Computational Mathematics, Princeton University, Princeton, U.S.A., Nov. 20 2006.

3.9.3 Invited seminars at universities and research institutions

28. The projection method for dynamical systems and kinetic equations modelling interacting agents in high-dimension, Dept. Math., Duke University, Sept. 2011.

29. The projection method for dynamical systems and kinetic equations modelling interacting agents in high-dimension, Depart. Math., University of Padua, Sept. 2011.

30. Particle systems and kinetic equations modeling interacting agents in high-dimension, Hausdorff Center for Mathematics, University of Bonn, June 2010

31. Mathematics enters the picture. An Italian touch on mathematical imaging, Center for Approximation Theory Seminar, Texas A&M University, U.S.A., Nov. 2009

32. Efficient numerical methods for L_1-minimization, Numerical Analysis Seminar, Texas A&M University, U.S.A., Oct. 2009

33. Special seminar: A Closer Look to Compressed Sensing, Sparse Recovery, and Generalizations, Department of Mathematics and Scientific Computing, University of Graz, Feb. 27, 2009

34. Compressive Algorithms. Adaptive Solutions of PDEs and Variational Problems, , Department of Mathematics and Scientific Computing, University of Graz, Feb. 26, 2009

35. Wavelets, joint sparsity, and image processing, FNRS Contact Group "Wavelets and applications", Universit libre de Bruxelles, Jan. 13, 2009.

36. Mathematics enters the picture, Department of Electronics and Informatics (ETRO), Vrije Universiteit Brussel, Jan. 13, 2009.

37. Mathematics enters the picture, Fraunhofer ITWM Bildverarbeitungslsungen, Kaiserslautern, Jan. 12, 2009.

38. A kinetic model for flocking, Hong Kong City University, Dec. 11, 2008.

39. Compressive algorithms, variational principles, and free-discontinuity problems, Department of Mathematics, University of Rome "Tor Vergata", September 23, 2008.

40. ℓ_1-minimization in compressive algorithms for PDEs and variational problems, Deparment of Mathematics, Universtiy of Pavia, Italy, May. 22, 2008.

41. L'applicazione, architetto della matematica. La matematica, architetto di nuove applicazioni (The application, architect of mathematics. Mathematics, architect of new applications), Faculty of Engineering, University of Bologna, May 20, 2008.

42. Compressive Algorithms. Adaptive Solutions of PDEs and Variational Problems, (invited seminar for an Associate Professorship in Numerical Analysis), Institute for Numerical Simulation, University of Bonn, Germany, May 16 2008.

43. A comparison of joint sparsity and total variation minimization algorithms in a real-life art restoration problem, Centre de Mathematiques et de Leur Applications, CNRS and École Normale Supriore de Cachan, France, May 15, 2008.

44. Domain decomposition methods for singular PDEs and applications in image processing, Laboratoire Jacques-Louis Lions, Université Pierre et Marie Curie, France, May 13, 2008.

45. ℓ_1-minimization in compressive algorithms for PDEs and variational problems, Department of Mathematics, Universtiy of Milano, Italy, Apr. 22, 2008.

46. Iterative thresholding algorithms and acceleration methods, Department of Mathematics, Philipps-University of Marburg, Germany, Mar. 25, 2008.

47. Compressive algorithms, Numerical Analysis seminar, Department of Applied Mathematics and Theoretical Physics, Center of Mathematical Sciences (CMS) of the University of Cambridge, UK, Mar. 6, 2008.

48. Iterative re-weighted least square algorithms for compressed sensing, School of Mathematics, University of Edinburgh, UK, Mar. 3 2008.

49. Compressive algorithms, Department of Mathematics, University of York, UK, Feb. 29 2008.

50. Compressive algorithms and variational problems, Department of Mathematics, University of Trieste, Italy, Feb. 19, 2008

51. PDE methods in image processing, PDE group seminar, Radon Institute for Computational and Applied Mathematics, Linz, Austria, Jan. 28 2008.

52. Iterative thresholding algorithms for inverse problems with sparsity constraints, Harmonic Analysis and Signal Processing Seminar, Courant Institute of Mathematical Sciences, NY University, USA, April 30, 2007.

53. A unified approach to iterative thresholding algorithms for sparse recovery, Norbert Wiener Center Seminar, University of Maryland, College Park, USA, April 12, 2007.

54. Variational calculus, wavelets, and image processing, Radon Institute for Computational and Applied Mathematics (RICAM), Linz, Austria, Feb. 7 2006.

55. Tecniche di ricostruzione di segnali e di immagini digitali con metodi di interpolazione e variazionali con vincoli, Workshop "Modelli differenziali e tecniche numeriche nel trattamento delle immagini", Department of Mathematics "Castelnuovo", University of Rome "La Sapienza", Apr. 15 2004.

56. Frame expansions for numerical analysis and signal/image processing. Applications in image pattern recognition and real world examples, "Graduiertenkolleg Angewandte Algorithmische Mathematik", Technische Universitaet Muenchen, Zentrum Mathematik, Nov. 3 2003.

57. Introduzione alla teoria degli spazi coorbita quale interpretazione unificata delle decomposizioni di Gabor e wavelets e possibili estensioni, Department of Mathematics, University Bicocca in Milano, Jun. 10 2002.

58. Analisi tempo-frequenza e algoritmi di pattern matching nel 2D, Deparment of Mathematics, University of Verona, Jun. 5 2002.

59. Gabor-wavelet transform and discrete frames, Department of Mathematics, University of Udine, Oct. 19 2001.

60. Local construction of global frames and applications, Department of Mathematics, Technical University of Denmark, Lyngby, Denmark, August 6 2001.

61. Flexible Gabor-wavelet transforms and applications in PDEs and signal processing, Department of Pure and Applied Mathematics, University of Padua, July 12 2001.

62. Un metodo per la rappresentazione ed il confronto di immagini a meno di rotazioni. Un contributo alla ricostruzione virtuale degli affreschi della Chiesa degli Eremitani in Padova, Department of Pure and Applied Mathematics, University of Padua, March 13 2000.

3.9.4 Invited talks at conferences and workshops

63. Inverse free-discontinuity problems and iterative thresholding algorithms, Modern Methods and Applications of the Calculus of Variations: Image Processing - Part I of V, ICIAM, Vancouver, July 19, 2011

64. Mathematics enters the picture: Mantegna's frescoes in Padua and their computer assisted restoration, Computational Methods for the Cultural Heritage, ICIAM, Vancouver, July 19, 2011

65. Learning functions of few arbitrary linear parameters in high dimension, Found. Comput. Math., Budapest, July 6, 2011

66. New applications of compression in numerical simulation in high dimension, From Abstract to Computational Harmonic Analysis, Strobl, June 13 - 19, 2011

67. Particle systems and kinetic equations modeling interacting agents in high-dimension, Banff, Mar. 5 - 12, 2011

68. Particle systems and kinetic equations modeling interacting agents in high-dimension, Dagstuhl, Jan. 30 - Feb. 04, 2011

69. Particle systems and kinetic equations modeling interacting agents in high-dimension, PDEs in kinetic theories: kinetic description of biological models, ICMS, Edinburgh, Nov. 9, 2010

70. Inverse free-discontinuity problems and iterative thresholding algorithms, Emerging Topics in Dynamical Systems and Partial Differential Equations - DSPDE's, Barcelona, May 31 - June 4 2010

71. Inverse free-discontinuity problems and iterative thresholding algorithms, SIAM Conference on Imaging Science (IS10), Chicago, U.S.A., April 12-14, 2010

72. Subspace correction methods for ℓ_1 and total variation minimization, SIAM Conference on Imaging Science (IS10), Chicago, U.S.A., April 12-14, 2010

73. Inverse free-discontinuity problems and iterative thresholding algorithms, AIP 2009, Vienna, July 21, 2009

74. Multilevel preconditioning in inverse problems with sparsity constraints, AIP 2009, Vienna, July 21, 2009

75. Inverse free-discontinuity problems and iterative thresholding algorithms EPSRC Symposium Capstone, Warwick Mathematical Institute, UK, June 30 – July 3, 2009.

76. Iterative thresholding: domain decompositions, multilevel preconditioning, and adaptivity, Tomography with Wavelets, Observatoire Océanologique, Villefranche-sur-Mer, France, May 28-30 2009.

77. A kinetic model of flocking, Workshop on Modern Topics in Nonlinear Kinetic Equations, University of Cambridge, UK, April 20-22, 2008.

78. Domain decomposition methods for total variation minimization, The Third International Conference on Scientific Computing and Partial Differential Equations at Hong Kong Baptist University, Hong Kong, Dec. 8-12, 2008.

79. Subspace decomposition method for very large scale sparse optimizations, Structured Decompositions and Efficient Algorithms, Dagstuhl Seminar, Germany, Nov. 30 – Dec. 5, 2008.

80. A kinetic model for flocking, Kinetic modelling for socio-economic and related problems, Vigevano, Italy, November 27-29, 2008.

81. Hot topics Workshop: Multi-Manifold Data Modeling and Applications, Institute for Mathematics and its Applications (IMA), University of Minnesota, U.S.A., October 27-30 2008.

82. Modern harmonic analysis and PDEs methods for visual art restoration, Modelling and Numerics for Monuments Conservation, University of Orleans, France, Sept. 4-5 2008.

83. Image and Signal Processing, Foundations of Computational Mathematics (FoCM08), Hong-Kong, China, Jun. 24-26, 2008.

84. Modern methods of harmonic analysis and PDEs in mathematical imaging, Mathknow08 - Mathematics, Applied Sciences, and Real Life, MOX - Technical University of Milan, Italy, May 23, 2008.

85. Inverse problems and sparsity measures, Minisymposium Inverse Problems with Sparsity Constraints, GAMM 2008, Bremen, Germany, Mar. 31 – Apr. 4, 2008.

86. Compressive algorithms: beyond adaptive wavelet methods in PDEs, Workshop on "Adaptive Numerical Methods for PDEs", Wolfgang Pauli Institute, Vienna, Austria, Jan. 21-25 2008.

87. Mathematical tools in signal processing and sparse optimization, Co. ESTECO S.r.l. www.esteco.com, Area Science Park, Trieste, Italy, December 14, 2007.

88. Evaluation of the project "Mathematical Methods for Image Analysis and Processing in the Visual Arts", WWTF, Vienna, Austria, December 5 2007.

89. Mathematics and art restoration, Institut für Konservierung und Restaurierung, Akademie der bildenden Künste Wien, Vienna, Austria, November 9 2007.

90. von Neumann Symposium "Sparse Representation and High-Dimensional Geometry", July 8-12, 2007

91. Recovery algorithms for vector valued data with joint sparsity constraints, Sparse Approximation Workshop, Nov. 10-12 2006, Princeton University, USA.

92. Frame adaptive methods for signal processing and operator equations, Workshop "Time-frequency analysis and stationary filtering", BIRS, Banff, Canada, Sept. 24-29 2005.

93. Some applications of localization of frame theory, Mathematisches Forschungsinstitut Oberwolfach, Feb. 18 2004.

94. Proposta per una anastilosi informatica degli affreschi della Cappella Ovetari nella Chiesa degli Eremitani in Padova, Consiglio di amministrazione della Fondazione Cassa di Risparmio di Padova e Rovigo, July 21 2000.

3.9.5 Contributed conference presentations

95. Subspace correction methods in sparse optimization, Workshop "Inverse Problems in Medical Imaging", Universitätszentrum Obergurgl, Austria, Jan. 22-27 2008.

96. Accelerated iterative thresholding algorithms, Conference on Applied Inverse Problems 2007: Theoretical and Computational Aspects, June 25-29, 2007.

97. Sparse recovery, free-discontinuity problems and image inpainting, Workshop on "PDEs and Variational Tools in Image Inpainting", Wolfgang Pauli Institute, Vienna, Austria, June 11-13, 2007.

98. Faithful recovery of vector valued functions from incomplete data. Recolorization and art restoration, Scale Space Variational Methods 2007, Ischia, Italy, May 30 - June 2, 2007.

99. Fast reconstruction algorithm for sparse multivariate and vector valued data, 1st Dolomites workshop on constructive approximation and applications, Sept. 8-12 2006, Alba di Canazei, Italia.

100. Variational methods, inpainting, and art restoration, Int. Conf. "Nonlinear PDEs: Homogenization and Kinetic Equations", Vienna, Austria, June 26-30 2006.

101. Linear inverse problems with joint sparsity constraints, Mini-workshop "Sparsity and Applications", Radon Institute for Computational and Applied Mathematics (RICAM), Linz, Austria, June 21 2006.

102. Fast algorithms for inverse problems with joint sparsity constraints, Int. Conf. Recent Progress in Spline and Wavelet Approximation, University of Rome La Sapienza, June 14-16 2006.

103. Metodi di campionamento non uniforme e variazionali per il restauro di immagini, Convegno nazionale GNCS, Dipartimento di Matematica F. Enriques, University of Milano, 14-16 febbraio 2006.

104. Adaptive algorithms. Mobile digital signal transmission, Int. Conf. MathMod, Vienna, Austria, February 8-10 2006.

105. On elementary sampling theorems on bounded domains, Int. Conf. ICNAAM 2005, Rodos, Greece, Sept. 16-20 2005.

106. Int. Conf. SampTA2005, Sampling Theory and Applications, Samsun, Turkey, July 10-15 2005.

107. Frames, greedy algorithms, and operator equations, Special Semester "Modern Methods of Time-Frequency Analysis", Third Workshop "Nonorthogonal expansions and greedy algorithms", Erwin Schroedinger Institute, Vienna, Austria, June 6-11 2005.

108. Frames, greedy algorithms, and operator equations, Int. Conf. "Modern Methods of Time-Frequency Analysis", Strobl, Austria, May 23-28 2005.

109. Image processing, greedy algorithms, and operator equations, HASSIP midterm meeting, Vienna, Austria, April 26-27 2005.

110. Adaptive frame methods for magnetohydrodynamic flows, MASCOT04 4th Meeting on Applied Scientific Computing and Tools (Grid generation, approximation, and visualization), Florence, Italy, Nov. 25-27 2004.

111. Frame decompositions in image processing: applications in art restoration, SIMAI 2004, Isola di San Servolo, Venice, Italy, Sept. 20-24 2004.

112. Construction of smooth (wavelet) frames and their applications, Int. Conf. Classical and New Approximation Spaces: Theory and Applications, Rome, Italy, Feb. 5-7 2004. 1.Interpolation of Banach spaces by means of Gabor-wavelet frames, Int. Conf. Wavelets and Splines, S. Petersburg, Russia, July 2-8 2003.

113. Flexible Gabor-wavelets decompositions for L2 Sobolev spaces, Int. Conf. SampTA2003, Sampling Theory and Applications, Strobl, Austria, May 2003.

114.Fast registration methods based on local circular harmonic frames and applications to art frescoes restoration, GAMM2003 (Conference of Gesellschaft fuer Angewandte Mathematik und Mechanik e. v. 2003), Abano Terme, Italy, 24-28 March 2003.

115. Fast homogenization algorithm based on asymptotic theory and multiscale schemes, GAMM2003 (Conference of Gesellschaft fuer Angewandte Mathematik und Mechanik e. v. 2003), Abano Terme, Italy, March 24-28 2003.

116. Flexible Gabor-wavelet continuous and discrete frames in alpha-modulation spaces, 2nd Int. Gabor Workshop, Vienna, Austria, Dec. 3-7 2002.

117. Generalized structured frame expansions: a bridge from Gabor to wavelet theory, kick-off meeting of the EU-network RTN HASSIP (Harmonic Analysis and Statistics for Signal and Image Processing) HPRN-CT-2002-00285, Department of Mathematics, University of Provence, Marseille, France, Nov. 14-16 2002.7

118. Un algoritmo di omogeneizzazione veloce basato sulla teoria asintotica e su schemi multiscala, "Convegno nazionale di Analisi Numerica: stato dell'arte", Arcavacata di Rende, University of Calabria, Sept. 26-28 2002.

119. Decompositions of Hilbert spaces: local construction of global frames, Int. Conf. Constructive Function Theory, Varna, Bulgaria, June 19-23 2002.

3.9.6 Invited public lectures

120. Mathematics Enters the Picture - The Restoration of Mantegna's Frescoes in Padua, öffentlicher Vortrag im Rahmen der Klassensitzung der mathematisch-naturwissenschaftlichen Klasse der ÖAW, October 15 2010.

121. Marie Curie International Fellowships, workshop on PEOPLE 4 YOU, BMWF – neue Medienräume, Vienna, Austria, May 13 2009.

122. Il Progetto Mantegna a Padova (The Mantegna Project in Padua), Conferenza Matematica e Cultura 2009, Auditorium Santa Margherita, University Ca Foscari of Venice, March 27, 2009.

123. Mathematics enters the picture, Interdisziplinäres Dialogforum (ID) – Kick-off, Senatssaal, University of Vienna, Dec. 4, 2008.

124. Matematica e applicazioni allarte e alla tecnologia (Mathematics and applications in art and technology), presentation of the book "Matematici al lavoro" (Mathematicians at work), Department of Mathematics, University of Milano, Italy, Apr. 22, 2008.

125. Matematica e Arte (Mathematics and Art), Istituto Comprensivo di Correzzola, Comune di Candiana, Candiana, Italy, December 15, 2007.

126. Marie Curie Outgoing International Fellowship, workshop on PEOPLE & IDEAS - Projekte im 7. EU-Rahmenprogramm, Österreichische Akademie der Wissenschaften, Vienna, Austria, December 7 2007.

127. Il "Progetto Mantegna" a Padova e Sviluppi (The Mantegna Project in Padua and Developments), University for Adult People, Belluno, Italy, December 21 2006.

128. Presentazione nazionale del "Progetto Mantegna" (National presentation of the Mantegna Project), Salone Internazionale del Restauro, Fiera di Ferrara, Italy, Mar. 29 2001.

3.10 Teaching

3.10.1 Invited short courses

- Numerical methods for sparse recovery, 5 hour course, Spring School, University of Aveiro, Portugal, Mar. 27 - Apr. 01 2011
- Numerical methods for sparse recovery, 5 hour course, Summer School on "Theoretical Foundations and Numerical Methods for Sparse Recovery" held at the Johann Radon Institute for Computational and Applied Mathematics (RICAM), Linz - Austria, on August 31 - September 4, 2009
- Sparse recovery algorithms from exact and incomplete data, 6 hour course, Dolomites Research Week on Approximation 2007, Sept. 4-6 2007, University of Verona, Alba di Canazei, Italy.
- Mathematical modelling, 6 hour course, WS07-08 (January 7,14 2008), University of Vienna, Vienna, Austria.

3.10.2 Courses

- Numerics of differential equations, WS11/12, Technical University of Munich, Germany
- Bounded variation functions and variational problems in imaging, special course, SS11, Technical University of Munich, Germany
- Calculus of variations and geometric measure theory, special course, SS10, University of Vienna, Austria
- Project seminar Discontinuous Galerkin Method for Total Variation minimization attached to the course of Numerical Methods for Elliptic PDEs (Ulrich Langer), SS10, Johannes Kepler University, Linz, Austria
- Inverse problems in mathematical imaging, regular course, WS09-10, University of Padua, Italy

- Project seminar Discontinuous Galerkin Method for Total Variation minimization attached to the course of Numerical Methods for Elliptic PDEs (Ulrich Langer), SS09, Johannes Kepler University, Linz, Austria
- Recent advances in numerical harmonic analysis, regular course, SS08, University of Padua, Italy
- Variational methods for free-discontinuity problems and sparse recovery, special course, WS07-08, Johannes Kepler University, Linz, Austria
- Recent advances in numerical harmonic analysis, regular course, SS07, University of Padua, Italy
- Numerical analysis laboratory, assistant, SS06, University of Rome "La Sapienza", Italy (large class at Engineering Fac.)
- Numerical analysis laboratory, assistant, SS05, University of Rome "La Sapienza", Italy (large class at Engineering Fac.)
- Mathematics for signal and image processing, regular course, WS03-04, University of Padua, Italy
- Numerical harmonic analysis, regular course, WS02-03, University of Padua, Italy
- Calculus I, assistant, WS99-00, University of Padua, Italy (large class at Engineering Fac.)

3.11 Students

3.11.1 Master students

Ilaria Patuzzi, February 2010 (co-supervisor Dr. Fabio Marcuzzi)
Laurea in Mathematics, University of Padua, Italy
Thesis (Italian) "Algoritmi di thresholding iterativo e riconoscimento della corrosione"
Grades: magna cum laude

Rocco Cazzato, October 2007 (co-supervisor Prof. Ruggero Frezza)
Laurea in Information Engineering, University of Padua, Italy
Thesis (Italian) "Un metodo per la ricolorazione di immagini e altri strumenti per il restauro - Il Progetto Mantegna e gli affreschi nella chiesa degli Eremitani"
Grades: best grades for an experimental thesis

Giulia Erica Valente, November 2006 (co-supervisor Dr. Fabio Marcuzzi)
Laurea in Mathematics, University of Padua, Italy
Thesis (Italian) "Gabor frames: teoria e algoritmi"
Grades: magna cum laude

3.11.2 Doctoral students

Andreas Langer
Johann Radon Institute for Applied and Computational Mathematics, Austrian Academy of Sciences
Linz, AUSTRIA
Feb. 2008 – Sept. 2011
Thesis "Subspace Correction and Domain Decomposition Methods for Total Variation Minimization"

Contribution to the supervision of the Ph.D. work of Rachel Ward (advisor Prof. Ingrid Daubechies, Program in Applied and Computational Mathematics, Princeton University, U.S.A., compare the paper [10]), and Carola-Bibiane Schönlieb (advisor Prof. Peter A. Markowich, Department of Applied Mathematics and Theoretical Physics (DAMTP), Centre for Mathematical Sciences, University of Cambridge, U.K., compare papers [7,11,41,44]).

3.11.3 PostDocs

Analysis of PDE group

Renjun Duan (Doctoral studies at City University Hong Kong)
Johann Radon Institute for Applied and Computational Mathematics, Austrian Academy of Sciences
Linz, AUSTRIA
October 2008 – September 2012

Massimo Fonte (Doctoral studies at S.I.S.S.A., Trieste, Italy)
Johann Radon Institute for Applied and Computational Mathematics, Austrian Academy of Sciences
Linz, AUSTRIA
April 2006 – March 2010

Francesco Solombrino (Doctoral studies at S.I.S.S.A., Trieste, Italy)
Johann Radon Institute for Applied and Computational Mathematics, Austrian Academy of Sciences
Linz, AUSTRIA
November 2011 – present time

Francesco Vecil (Doctoral studies at the Autonomous University of Barcelona, Spain)
Johann Radon Institute for Applied and Computational Mathematics, Austrian Academy of Sciences
Linz, AUSTRIA
October 2008 – September 2009

START Project team (`http://hdsparse.ricam.oeaw.ac.at/`)

Jan Haskovec (Doctoral studies at the University of Vienna, Austria)
Johann Radon Institute for Applied and Computational Mathematics, Austrian Academy of Sciences
Linz, AUSTRIA
July 2009 – present time

Yunho Kim (Doctoral studies at UC Los Angeles, U.S.A.)
Johann Radon Institute for Applied and Computational Mathematics, Austrian Academy of Sciences
Linz, AUSTRIA
July – Sept. 2009

Karin Schnass (Doctoral studies at the Ecole Polytechnique Fédérale de Lausanne, Switzerland)
Johann Radon Institute for Applied and Computational Mathematics, Austrian Academy of Sciences
Linz, AUSTRIA
January 2010 – present time

Jan Vybiral (Doctoral studies at the Friedrich-Schiller University of Jena, Germany)
Johann Radon Institute for Applied and Computational Mathematics, Austrian Academy of Sciences
Linz, AUSTRIA
October 2009 – present time

3.12 Approved grants, external projects

START award (FWF - Fonds zur Förderung der wissenschaftlichen Forschung, Austria, 6 years)
Project title “Sparse Approximation and Optimization in High-Dimensions”
Submission date Feb. 22 2008, approval date Nov. 8 2008
PI: M. Fornasier
Apr. 2009 - Mar. 2015

Amount 1.137.860 EUR

WWTF "Five Senses - Call 2006" (4 years), Project Mathematical Methods for Image Analysis and Processing in Visual Arts
Nov. 2006 - Oct. 2010
PIs: W. Baatz, M. Fornasier, B. Kowanz, P. Markowich
Amount: 400.000 EUR

Marie Curie Outgoing International Fellowship (contract MOIF-CT-2006-039438, 18 months) of the European Commission (6th Framework Programme)
Project "Sparse Approximation for Blind Source Separation"
Oct. 2006 - March 2008
PI: M. Fornasier
Amount: 120.000 EUR

Individual Marie Curie Fellowship (contract MEIF-CT-2004-501018, 2 years) of the European Commission (6th Framework Programme)
Project "Flexible Time-Frequency Decompositions and Adaptive Treatment of Operator Equations by Frames"
May 2004 - April 2006
PI: M. Fornasier
Amount: 130.000 EUR

Mantegna Project www.progettomantegna.it (3 years) Fondazione Cassa di Risparmio di Padova e Rovigo and University of Padua
Oct. 2001 - Sept. 2004
PIs: M. Fornasier and D. Toniolo
Amount: 525.000 EUR

3.13 Other activities

3.13.1 Journal reviewing

Applied and Computational Harmonic Analysis, Computer Graphics Forum, Foundation of Computational Mathematics, IEEE Signal Processing Letters, IEEE Transaction on Image Processing , IMA Journal of Numerical Analysis, Inverse Problems, Journal of the American Mathematical Society, Journal of Computational and Applied Mathematics, Journal of Fourier Analysis and Applications, Journal of Functional Analysis, Journal of Function Spaces and Applications, Journal on Sampling Theory in Signal and Image Processing, Mathematische Nachrichten, Numerical Algorithms, Numerische Mathematik, SIAM Journal on Mathematical Analysis, SIAM Journal on Numerical Analysis, SIAM Journal on Optimization.

3.13.2 Conference, workshop, meeting organization

- 2011 Foundations of Computational Mathematics Conference, co-organizer (jointly with Martin Buhmann and Nira Dyn) of the minisymposium "Approximation theory"
- 2010 Workshop "Sparsity and Computation", co-organizer (jointly with Ronald DeVore and Holger Rauhut), Hausdorff Center for Mathematics Bonn, June 7-11, 2010, Bonn, Germany
- 2010 Minisymposium "Particle and Mean Field Models for Flocking and Swarming" co-organizer (with Alethea Barbaro), Emerging Topics in Dynamical Systems and Partial Differential Equations DSPDEs'10, May 31 - June 4, 2010, Barcelona, Spain
- 2010 GAMM co-organizer (jointly with Micheal Hintermüller) of the session on Mathematical Imaging, March 22-26, 2010, Karlsruhe, Germany

- 2009 Summer School on ”Theoretical Foundations and Numerical Methods for Sparse Recovery” held at the Johann Radon Institute for Computational and Applied Mathematics (RICAM), Linz - Austria, on August 31 - September 4, 2009 http://www.ricam.oeaw.ac.at/events/summerschool_2009/ (more than 70 confirmed students from 19 countries)
- 2009 Member of the Technical Program Committee for the Int. Conf. “Signal Processing with Adaptive Sparse/Structured Representations” (SPARS2009), Apr. 7-10 2009, Saint-Malo, France
- 2009 Special session “Sampling and (in)painting” at the Int. Conf. “Sampling Theory and Applications 2009” (SampTA 2009), Centre International de Rencontres Mathematiques (CIRM), May 28-22., 2009, Marseille-Luminy, France
- 2008 Minisymposium “Compressive algorithms for applied inverse problems with sparse solutions”, IX SIMAI - Società Italiana di Matematica Applicata e Industriale - Conference, September 15-19, 2008, Rome, Italy
- 2008 Thematic Programme “Applied Analysis and Fast Computation in Phase-Space”, September 2008, Wolfgang Pauli Institute, Vienna University, Austria
- 2007 Workshop “PDEs and Variational Tools in Image Inpainting” June 11-12 2007, Wolfgang Pauli Institute, Vienna University, Austria
- 2006 Mini-workshop “Sparsity and Applications”, June 21 2006, Johann Radon Institute for Computational and Applied Mathematics (RICAM), Austrian Academy of Sciences, Linz, Austria
- 2006 Int. Conference “Recent Progress in Spline and Wavelet Approximation”, June 14-16 2006, Rome, Italy
- 2004 Int. Conference “Classical and New Approximation Spaces: Theory and Applications”, Feb. 5-7 2004, Rome, Italy