

# Dr. rer. nat. Benjamin Scharf – Curriculum Vitae

## Contact Information

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## Personal Information

born on 29th November 1985 in Jena, Germany  
Nationality German

## Research interests

Sparse optimal control of dynamical systems, Besov regularity of  $p$ -Laplacian, high-dimensional optimal control, Wavelet characterizations of function spaces

## Education

09/1992 – 05/2004 School education, Abitur at Carl-Zeiss-Gymnasium Jena with honors  
10/2004 – 03/2009 Studying Mathematics with secondary subject Computer Sciences at Friedrich Schiller University Jena, Germany  
02/2007 – 03/2009 Scholarship of Studienstiftung des deutschen Volkes  
03/2009 Diploma in Mathematics with honors  
Diploma thesis: *Atomare Charakterisierungen vektorwertiger Funktionenräume*  
Supervisor: Hans-Jürgen Schmeißer  
10/2010 Honored with the exam price of the dean

## Academic Career

08/2009 – 02/2013 PhD student in the Research group *Function spaces* at Mathematical Institute of Friedrich Schiller University Jena  
PhD Scholarship of Studienstiftung des deutschen Volkes  
02/2013 PhD in mathematics, title Dr. rer. nat., summa cum laude  
PhD subject: *Wavelets in function spaces on cellular domains and manifolds*  
Supervisors: Hans-Jürgen Schmeißer and Hans Triebel  
since 03/2013 Postdoc at TU Garching (Munich) in the ERC-Starting Grant project *High-Dimensional Sparse Optimal Control*  
Head: Massimo Fornasier

## Publications

- 4 B. Scharf, *Wavelet decomposition techniques and Hardy inequalities for function spaces on cellular domains* (2013), submitted to Journal of Approximation Theory.
- 3 B. Scharf, *Atomic representations in function spaces and applications to pointwise multipliers and diffeomorphisms, a new approach*, Math. Nachr. **286** (2013), no. 2–3, 283–305.
- 2 B. Scharf, H.-J. Schmeißer, and W. Sickel, *Traces of vector-valued Sobolev Spaces*, Math. Nachr. **285** (2012), no. 8–9, 1082–1106.
- 1 B. Scharf, *Local means and atoms in vector-valued function spaces*, Jenaer Schriften zur Mathematik und Informatik (2010), Math/Inf/05/10.

## Selected Talks

- 4 *How to steer high-dimensional Cucker-Smale systems to consensus using low-dimensional information only*  
TUM-IAS Workshop "Novel Numerical Methods - Shifting the Borders of Computability", 07/2013, Munich, Germany: Best Doctoral Student Presentation Award  
Seminar Analysis und Theoretische Numerik, 07/2013, Siegmundsburg, Germany.
- 3 *Wavelets for reinforced function spaces on cellular domains*  
Seminar Analysis and Numerics, 12/2013, Prague, Czech Republic.  
Workshop Applied Coorbit theory, 09/2012, Vienna, Austria.  
International Conference Function Spaces X, 07/2012, Poznan, Poland.  
Mathematical Seminar at Beijing Normal University, 10/2011, Beijing, China.
- 2 *Pointwise multipliers and diffeomorphisms in function spaces*  
8th International Conference FSDONA, 09/2011, Tabarz, Germany.  
Seminar Adama Mickiewicz University Poznan, 05/2011, Poznan, Poland.
- 1 *Local means and atoms in vector-valued Function Spaces*  
Mathematical Seminar at Steklov Mathematical Institute, 09/2010, Moscow, Russia.  
Workshop on Smoothness, Approximation, and Function Spaces, 09/2010, Oppurg, Germany.

## Teaching

10/2007 – 07/2008	Exercises for Lectures <i>Höhere Analysis 1</i> and <i>Höhere Analysis 2</i> by Prof. Hans-Gerd Leopold
10/2008 – 07/2009	Exercises for Lectures <i>Analysis 1</i> and <i>Analysis 2</i> by Prof. Hans-Jürgen Schmeißer
10/2009 – 07/2010	Exercises for Lectures <i>Analysis 1</i> and <i>Analysis 2</i> by Prof. Bernd Carl
10/2010 – 07/2011	Exercises for Lectures <i>Höhere Analysis 1</i> and <i>Höhere Analysis 2</i> by Prof. Dorothee D. Haroske
10/2011 – 07/2012	Exercises for Lectures <i>Algebra 1</i> and <i>Algebra 2</i> by Prof. Klaus Haberland
10/2012 – 02/2012	Exercises for Lecture <i>Analysis 3</i> by Prof. Hans-Jürgen Schmeißer

## Miscellaneous

Languages	German, native speaker English, business fluent Latin, school knowledge 6 years
IT-Knowledge	Mathematical Software (Matlab, Scilab, Gnuplot) Office (Word, Excel, Powerpoint, LaTeX) Computer languages (Java, Oberon, C++) Linux, Windows
Activities and Interests	Basketball as a coach, player, referee and fan Financial education Headphones and Loudspeakers

Garching, 09.08.2013