

## CURRICULUM VITAE.

STEFANIE PETERMICHL

Nationality: German.

Occupation: Professor.

Family situation: married, two children (born 2008 and 2009)

### Work address:

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### Education.

1996-2000:

Graduate school in mathematics at Michigan State University.

Thesis title: *Some sharp estimates involving the Hilbert transform.*

Advisor: A. Volberg (Michigan State University).

1991-1995:

Student in mathematics at the University of Karlsruhe

### Positions.

2009-present:

Professeur, PR1, Université Paul Sabatier, Toulouse, France

2007-2009:

Professeur, PR2, Université Bordeaux 1, Talence, France

2005-2007:

Assistant Professor, University of Texas at Austin, Austin, TX, USA  
(early tenure in 2007)

2001-2005:

Tamarkin Assistant Professor, Brown University, Providence, RI, USA

2001-2002:

Member, Institute for Advanced Study, Princeton, NJ, USA

2000-2001:

Research Instructor, Michigan State University, East Lansing, MI, USA

### Research interests.

I am interested in harmonic analysis, operator theory and probability.

## Grants.

2017-2022

European Research Council (ERC) Grant as principal investigator

2017

MSRI, research professor, 4 months

2015-2016

Hausdorff Institut Bonn, grant for one month per year for a group of four

2008-present

support in various group grants by Agence Nationale de la Recherche (ANR)

2006-2007

National Science Foundation (NSF) personal research grant

2006

Banff: research in teams, group of four

2002-2005

National Science Foundation (NSF) personal research grant

2006

National Science Foundation Young Investigator grant (YI) at Texas AM University

2001-2002

NSF grant at the Institute for Advanced Study, Princeton

1991-1996

Fellowship Studienstiftung des deutschen Volkes, a German national grant.

## Prices and Awards.

2018

ICM invited lecture

2017

ERC grant awarded

2015

Plenary Speaker EMS-LMS

2012, 2013

*Novelisa* award by the city of Toulouse

2012-present

Junior member of the Institut Universitaire de France (IUF)

2012

*Ernest Déchelle* prize of the French academy of science (Académie des Sciences)

2006

*Salem* prize. <http://en.wikipedia.org/wiki/SalemPrize>

I have received the *Salem prize* for the discovery of the dyadic Hilbert transform and its applications. Namely a sharp vector commutator estimate (1) and the solution of the  $A_2$  conjecture for the Hilbert transform, a sharp weighted estimate (2).

(1) S. Petermichl

*Dyadic Shifts and a Logarithmic Estimate for Hankel Operators with Matrix Symbol*,  
Comptes Rendus Acad. Sci. Paris, t.330, no.1, pp.455-460, 2000.

(2) S. Petermichl

*The Sharp Bound for the Hilbert Transform in Weighted Lebesgue Spaces in Terms*

*of the Classical  $A_p$  Characteristic*  
Amer. J. Math. 129 (2007), no. 5, 1355–1375.

I have received the *Ernest Déchelle prize* for the totality of my work.

### **Responsibilities.**

#### *Administrative.*

- (1) 2016-present: Habilitation Commission, Representant for Mathematics
- (2) 2011-2016: Member of Conseil National des Universités (CNU) rang A
- (3) 2009- present: Member of numerous hiring commissions in France and Greece.
- (4) 2014: Member committee AERES (French ranking agency)

#### *Teaching.*

- (1) 1993-1995: Germany, Karlsruhe as an undergraduate: Position as teaching assistant 2h/week + grading. I was assistant for basic engineering courses at first and then for graduate algebra courses.
- (2) 1995-2001: USA, Michigan State as a graduate student: 4 courses per year, 6h/week + grading + office hours. Including Harvard reform calculus.
- (3) 2002-2005: USA, Brown University, as postdoc: 3 courses per year, 4,5 h/week + grading + office hours. All levels.
- (4) 2005-2007: USA, Austin, TX as professor: 2 courses per year, 3h/week + office hours. Including experimental methods, such as the Moore method. All levels.
- (5) 2007-2009: Bordeaux, France, as professor: 190-240 hours per year, compares to 5-6 courses a year + grading. All levels.
- (6) 2009-present: Toulouse, France, as professor: same as in Bordeaux, but reduced by 2/3 thanks to IUF (2012-2016) then ERC (2017-2022).

#### *Supervision (graduate).*

- (1) 2015-present: Graduate student Dahmani, expected PhD 2018.
- (2) 2011-2014: Graduate student Laurent Dalenc, graduated with PhD in 2014.
- (3) -present: many collaborations with post-docs and graduate students, (for example recently, Y. Ou, K. Bickel, I. Holmes)
- (4) 2009-present: Jury member for several PhD students in France and Spain.
- (5) 2005-2006: Jury qualifying candidacy exam, graduate level.

#### *Evaluation.*

- (1) Referee (at least 10 per year) as well as pre-review 'screening'. Annals of Math., Acta, JAMS, Advances, Amer. J. Math, JFA etc., IMRN, Revista, Duke, Annales ENS.
- (2) Evaluation of research projects (France and Israel)
- (3) LAME chair search committee with Smirnov, Laurent, Kisliakov, Burq, Matiyasevich
- (4) Editorial board member for Potential Analysis
- (5) Editorial board member for Revista Mathematica Iberoamericana

#### *Outreach.*

- (1) 2013: Maths in Jeans, main lecture for school children, age 11-17.

### **Career breaks.**

- (1) 10.3. 2008: birth of first child.
- (2) 25.11. 2009: birth of second child.

## Publications.

- (1) S. Petermichl  
*Dyadic Shifts and a Logarithmic Estimate for Hankel Operators with Matrix Symbol*,  
Comptes Rendus Acad. Sci. Paris, t.330, no.1, pp.455-460, 2000. (Compte Rendu original)
- (2) S. Petermichl  
*Some Sharp estimates Involving the Hilbert Transform*,  
Thèse, Michigan State University, 2000.
- (3) S. Petermichl, J. Wittwer  
*A Sharp Estimate for Weighted Hilbert Transform via Bellman Functions*  
Mich. Math. J. 50, 2002, pp.71-87.
- (4) S. Petermichl, S. Pott  
*A Version of Burkholder's Theorem for Operator-weighted Spaces*  
Proc. Amer. Math. Soc. 13,1 2003 no.11 pp.3457-3461.
- (5) S. Petermichl, S. Pott  
*An Estimate for Weighted Hilbert Transform via Square Functions*  
Trans. Amer. Math. Soc 354, 2002, pp.1699-1703.
- (6) S. Petermichl, A. Volberg  
*Heating of the Beurling Operator: Weakly Quasiregular Maps on the Plane are Quasiregular*  
Duke Math. J. Vol. 112, No 2, 2002, pp.281-305.
- (7) S. Petermichl, S. Treil, A. Volberg  
*Why are the Riesz Transforms Averages of the Dyadic Shifts?*  
Publ. Mat., Vol. Extra, 2002, pp.209-228.
- (8) S. Petermichl  
*Asymptotics, frequency modulation and low regularity illposedness for canonical defocusing equation*  
Proc. of Summer school, Lake Arrowhead 2004.
- (9) O. Dragicević, L. Grafakos, M.C. Pereyra and S. Petermichl  
*Extrapolation and Sharp Norm Estimates for Classical Operators on Weighted Lebesgue Spaces*,  
Publ. Mat., 49, 2005, no.1, pp.73-91.
- (10) S. Petermichl  
*The Sharp Bound for the Hilbert Transform on Weighted Lebesgue Spaces in Terms of the Classical  $A_p$  Characteristic*  
Amer. J. Math. 129 (2007), no. 5, 1355–1375.
- (11) O. Dragicević, S. Petermichl, A. Volberg  
*A Rotation Method which Gives Linear  $L^p$ -Estimates for Powers of the Ahlfors-Beurling Operator*,  
J. Math. Pures Appl. (9) 86, 2006, no. 6, 492–509.
- (12) S. Petermichl  
*The Sharp Weighted Bound for the Riesz Transforms*,  
Proc. Amer. Math. Soc. 136 (2008), no. 4, 1237–1249.
- (13) S. Petermichl, M. Dindos, J. Pipher  
*A  $p$ -adapted Square function and the  $L^p$  Dirichlet problem*,  
J. Funct. Anal. 249, 2007, no. 2, pp.372–392

- (14) S. Petermichl, S. Treil, B. Wick  
*Carleson potentials and the reproducing kernel thesis for embedding theorems*  
Illinois J. Math. 51 (2007), no. 4, 1249–1263.
- (15) S. Petermichl, B. Wick  
*A dimension-free bound for the weighted Lusin area integral on the unit ball of  $\mathbb{C}^n$ ,*  
Ark. Mat. 45 (2007), no. 2, 337–350.
- (16) S. Petermichl, J. Wittwer  
*Heating of the Beurling operator: Sufficient conditions for the two weight case,*  
Studia Math. 186 (2008), no. 3, 203–217.
- (17) M. Lacey, S. Petermichl, J. Pipher, B. Wick  
*Higher order Riesz commutators,*  
Amer. J. Math. 131 (2009), no. 3, 731–769.
- (18) M. Lacey, S. Petermichl, J. Pipher, B. Wick  
*Iterated Riesz Commutators: a simple proof of boundedness,*  
Contemp. Math., 505, Amer. Math. Soc., Providence, RI, (2010), 171–178.
- (19) M. Lacey, S. Petermichl, M. del Carmen Reguera-Rodriguez  
*Sharp  $A_2$  inequality for Haar Shift Operators*  
Math. Ann. 348 (2010), no. 1, 127–141.
- (20) S. Petermichl, L. Slavín, B. Wick  
*New estimates for the Beurling-Ahlfors operator on differential forms,*  
J. Operator Theory 65 (2011), no. 2, 307–324.
- (21) M. Lacey, S. Petermichl, J. Pipher, B. Wick  
*Multi-parameter Div-Curl Lemmas,*  
Bull. London Math. Soc. 10 (2012), 1123–1131.
- (22) L. Dalenc, S. Petermichl  
*A lower bound criterion for iterated commutators,*  
J. Funct. Anal. 266, (2014), 5300–5320.
- (23) K. Domelevo, S. Petermichl  
*Sharp  $L^p$  estimates for discrete second order Riesz transforms,*  
C.R. Math. Acad. Sci. Paris 352 (2014), no. 6, 503–506.
- (24) K. Domelevo, S. Petermichl  
*Sharp  $L^p$  estimates for discrete second order Riesz transforms,*  
Adv. Math. 262, (2014), 932–952.
- (25) K. Bickel, S. Petermichl, B. Wick  
*Bounds for the Hilbert transform with matrix  $A_2$  weights ,*  
J. Funct. Anal. 270 (2016), no. 5, 1719–1743.
- (26) Y. Ou, S. Petermichl, E. Strouse  
*Higher Order Journé Commutators and multi-parameter BMO,*  
Adv. Math. 291 (2016) 24–58.
- (27) F. Bernicot, D. Frey, S. Petermichl  
*Sharp Weighted Norm Estimates beyond Calderon-Zygmund Theory,*  
Anal. PDE 9 (2016) 1079–1113.
- (28) N. Arcozzi, K. Domelevo, S. Petermichl  
*Sharp  $L^p$  estimates for second order Riesz transforms on multiply-connected Lie groups,*  
Potential Anal. 45 (2016), no. 4, 777–794.
- (29) K. Domelevo, S. Petermichl, J. Wittwer  
*A dimensionless weighted bound for the Riesz vector in  $\mathbb{R}^n$*   
Bull. Sci. Math. 141 (2017), no. 5, 385407.

- (30) F. Nazarov, S. Petermichl, S. Treil, A. Volberg  
*Convex body domination and weighted estimates with matrix weight,*  
Adv. Math. 318 (2017), 279–306.
- (31) Y. Ou, S. Petermichl  
*Little BMO and Journé Commutators,*  
to appear in Esterle’s conference proceedings.
- (32) M. Dindos, S. Petermichl, J. Pipher  
*The BMO solvability and the  $A_\infty$  condition for second order parabolic operators,*  
to appear Annales de l’Institut Henri Poincaré / Analyse non lineaire.
- (33) I. Holmes, S. Petermichl, B. Wick  
*Weighted little bmo and two-weight inequalities for Journé commutators,*  
to appear Analysis and PDE (2017).
- (34) K. Domelevo, S. Petermichl  
*Differential Subordination under Change of Law,*  
under minor revision Annals of Probability (2017).
- (35) O. Dragicevic, S. Petermichl, A. Volberg  
*Sharp estimates for martingale transforms in higher dimensions and applications to the Beurling operator*  
preprint (2008)
- (36) N. Arcozzi, K. Domelevo, S. Petermichl  
*Discrete Hilbert Transform a la Gundy-Varopoulos,*  
preprint (2015) submitted.
- (37) K. Domelevo, S. Petermichl  
*A Sharp Maximal Inequality for Differentially Subordinate Martingales under a Change of Law,*  
preprint (2016) submitted.
- (38) K. Domelevo, A. Osekowski, S. Petermichl  
*Various sharp estimates for semi-discrete Riesz transforms of the second order,*  
preprint (2017) submitted
- (39) T. Hytonen, S. Petermichl, A. Volberg  
*The sharp square function estimate with matrix weight,*  
preprint (2017) submitted.
- (40) K. Domelevo, P. Ivansvilli, S. Petermichl, S. Treil, A. Volberg  
*On the failure of lower square function estimates in the non homogenous weighted setting,*  
preprint (2017) submitted

### **Conference and seminar Organization.**

- 2000-2001 Analysis seminar organiser Michigan State
- May 2012 ANR international meeting Toulouse, France (with P. Thomas)
- 2014-present Analysis seminar organiser Toulouse (with F. Barthe and P. Thomas)
- 2014-present Seminaire Bordeaux-Toulouse
- July 2016 Conference (with H. Hedenmalm and A. Poltoratski), Mittag Leffler, Sweden
- August 2016 Alexander Volberg's birthday (with M. Sodin, T. Iwaniec, S. Treil), Bedlewo, Poland
- October 2016 GDR international meeting Toulouse (with Barthe, Belinshi, Thomas), France

## Conference Talks and Colloquia.

January 2000	AMS annual meeting, Washington DC, USA
February 2000	University of Chicago, Chicago, IL, USA
May 2000	Universitaet Karlsruhe, Karlsruhe, Germany
July 2000	Linear analysis and probability workshop, Texas A&M, College Station, TX, USA
October 2000	Rajchman-Zygmund-Marcinkiewicz Symposium, Bedlewo, Poland
June 2001	AMS conference on Harmonic Analysis, Mount Holyoke, MA, USA
August 2001	Euler Institute, St. Petersburg, Russia
June 2003	First Joint Meeting of RSME and AMS, at Sevilla, Spain
July 2003	Park City Mathematics Institute, Park City, UT, USA
August 2004	Summer school on Integrable systems, Lake Arrowhead, CA, USA
June 2005	AMS-DMV- OMG meeting, Mainz, Germany
July 2005	MFO Oberwolfach, Germany
October 2005	North British functional anaysis seminar lecture series, Glasgow, UK
April 2006	AMS sectional meeting, Notre Dame, IN, USA
June 2006	CIRM Marseille, France
June 2006	HARP, Crete, Greece
August 2006	Satellite Conference to the ICM-2006 Madrid at Sevilla, Spain
October 2006	AMS sectional meeting, Salt Lake City, UT, USA
October 2007	Pau, France
November 2007	CIRM, Luminy, France
June 2008	El Escorial, Spain
July 2008	MF Oberwolfach, Germany
December 2008	Sevilla, Spain
May 2011	Antibes Lectures, Nice, France
July 2012	Séminaire Analyse, Paris 6, Paris, France
Oct 2012	Lectures for Académie des Sciences, Tours, France
May 2013	Hilbert function Spaces, Gragnano, Italy
May 2013	Joint meeting, Madrid, Spain
December 2013	Helsinki colloquium, Finland
December 2013	Stochastics, Harmonic Analysis and PDE, Jyvaskyla, Finland
June 2014	Colloquium in honour of Aline Bonami, Orléans, France
June 2014	Michael Cowling Birthday, Segovia, Spain
July 2014	Oberwolfach, Germany
August 2014	Colloque Franco-Rumain, Lyon, France
October 2014	ICERM, Providence, RI, USA
June 2015	Retirement Conference in honour of Jean Esterle, plenary, Bordeaux, France
June 2015	Mittag Leffler Stockholm, Sweden



May 2015 Probabilistic Analysis conference, plenary mini-series, Helsinki, Finland  
 September 2015 150th birthday celebration EMS-LMS, plenary address, Birmingham, UK  
 October 2015 Harmonic Analysis and PDE, plenary, Edinburgh, UK  
 November 2015 Stochastic Analysis Seminar of Terry Lyons, Oxford, UK  
 June 2016 Colloquium, Kiel, Germany  
 June 2016 Victor Havin memorial Conference, plenary, Euler Institute St. Petersburg, Russia  
 July 2016 Mini-cours, Bilbao, Spain  
 August 2016 Joint lecture with Nikolski and Treil on the life of Volberg, Bedlewo, Poland  
 December 2016 Young women in harmonic analysis and PDE, lecture series, Bonn, Germany  
 January 2017 AMS joint meeting in honour of Cora Sadosky, Atlanta, GA, USA  
 January 2017 Connections for Women, MSRI  
 March 2017 Ohio River Analysis Meeting (ORAM), plenary, Cincinnati, OH, USA  
 March 2017 Colloquium Ohio State University, Columbus, OH  
 May 2017 Recent Advances in Harmonic Analysis, MSRI  
 July 2017 Oberwolfach, Germany.  
 August 2017 IWOTA, 40m plenary, Chemnitz, Germany.  
 September 2017 Clay satellite workshop of Guth and Katz, Oxford, UK  
 October 2017 AIM workshop, San Jose, CA  
 October 2017 North Eastern Analysis meeting, plenary, Albany, NY  
 October 2017 Colloquium Kent State, Kent, OH  
 October 2017 Colloquium Madison, WI  
 Future Invitations  
 February 2018 McIntosh memorial conference, plenary, Canberra, Australia  
 April 2018 CIRM, plenary, Marseille, France  
 July 2018 ICM satellite conference, plenary, Brazil  
 August 2018 ICM, analysis and operator algebras, sec 8, Rio de Janeiro, Brazil