

FRANCIS SEUFFERT

(201) 819-9688

seuffert@sas.upenn.edu

Department of Mathematics

University of Pennsylvania

David Rittenhouse Lab.

209 South 33rd Street

Philadelphia, PA 19104-6395

ACADEMIC APPOINTMENTS

1. *University of Pennsylvania*, Philadelphia, NJ, 2017-Present

Vice Provost Postdoctoral Fellow

Adviser: Ryan Hynd

EDUCATION

1. *Rutgers University*, Piscataway, NJ, 2010-2016

PhD in Mathematics, 2016, Specialization: Functional Analysis and PDEs.

Thesis Adviser: Eric Carlen.

2. *SUNY Stony Brook*, Stony Brook, NY, 2009-2010

3. *Princeton University*, Princeton, NJ, 2005-2009

B.A. in Mathematics

PUBLICATIONS

- F. Seuffert, *An Extension of the Bianchi-Egnell Stability Estimate to Bakry, Gentil, and Ledoux's Generalization of the Sobolev Inequality to Continuous Dimensions*. *Journal of Functional Analysis*, **273**, Issue 10 (2017), 3094-3149.
- F. Seuffert, *A Stability Result for a Family of Sharp Gagliardo-Nirenberg Inequalities*. arXiv:1610.06869, 2016.
- E. A. Carlen, F. Seuffert, *A Bianchi-Egnell Type Stability Estimate of the Onofri Inequality*. In preparation.

RESEARCH EXPERIENCE

1. Mathematics Department, University of Pennsylvania

Vice Provost Postdoctoral Fellow 2017-Present

Research Adviser: Ryan Hynd

- Researching the value of the sharp constant of the seminorm form of Morrey's Inequality, as well as the existence of extremals, and formula for extremals
- Working with Eric Carlen on extending Bakry, Gentil, and Ledoux's continuous dimension extension of the Sobolev Inequality to when the radial variable has dimension between 0 and 1.

2. Mathematics Department, Rutgers University

Doctoral Research 2010-2016

Research Adviser: Eric Carlen

- Extended Bianchi-Egnell Stability Estimate of Sobolev Inequality to cylindrically symmetric functions in continuous dimensions
- Established a stability estimate for a family of sharp Gagliardo-Nirenberg Inequalities
- Established Local Bianchi-Egnell type stability estimate for Onofri Inequality
- Started researching potential application of Bianchi-Egnell Stability Estimate in proving a result established by Duyckaerts, Kenig, and Merle on type II blow-up solutions of focusing energy-critical wave equation

3. Mathematics Department, Princeton University, Princeton NJ
Undergraduate Summer Research and Senior Thesis 2008-2009

Research Adviser: David Gabai

- Classified topological invariants of train tracks on twice-punctured torus
- Read and wrote proofs pertaining to Dale Rolfsen's *Knots and Links*.

RESEARCH INTERESTS

- Sharp functional inequalities: deriving their sharp forms and classifying extremals
- Use of calculus of variations in establishing stability estimates of sharp inequalities
- Exploring the relationship between the Sobolev Inequality and other inequalities like the Gagliardo-Nirenberg inequalities
- Applying stability estimates to deduce solutions to PDEs
- Analysis of the focusing energy-critical wave equation
- Nondegeneracy of sequences derived from PDE iteration schemes

TEACHING EXPERIENCE

1. Yu's Elite Education, 2014-2016

Teacher

- Taught elementary and middle school children in a variety of classes
- Fall 2016, taught six sections: Arithmetic and Geometry, two sections; 8th grade competition Math, two sections; Pre-Algebra, one section; and Algebra and Geometry, one section
- Other classes taught in past are Arithmetic and Geometry; Pre-Algebra; Algebra and Geometry; 8th grade competition Math; and Introduction to Number Theory, Combinatorics, and Geometry
- Classes varied from five to fifteen students
- Wrote lesson plans; lectured; wrote and graded homework and exams; interacted with parents

2. Rutgers University, 2010-2016

Teaching Assistant

- Calculus II for Mathematical and Physical Sciences
- Conducted three workshops a week each with about 25 students; held office hours
- Wrote and graded quizzes and homework

Grader

- Advanced Calculus for Engineering
- Graded homework and exams

Grader

- Introduction to Mathematical Reasoning
- Graded homework

Teaching Assistant

- Calculus I
- Conducted three recitations a week each with about 25 students; held office hours
- Wrote and graded quizzes

3. Bergen Community College, 2010-2013

- Tutored one on one and conducted study groups
- Tutored all levels of Math from Pre-Algebra to Differential Equations
- Conducted study groups in Calculus and Statistics with between five and fifteen students
- Wrote Qualifying exam for calculus tutors

4. SUNY Stony Brook, 2009-2010

- Calculus B
- Conducted three recitations a week each with about 25 students; held office hours