

A Seminar on Geometric Measure Theory, Varifolds, and Their Applications

July 9-12, 2018

Portland State University
Portland, Oregon

Room Location: B1-82 Science Research & Teaching Center (SRTC)

Ulrich Menne (U.M.) and Sławomir Kolasiński (S.K.) will visit from the University of Leipzig/Max Planck Institute for Mathematics in the Sciences and the University of Warsaw, respectively, to teach a three-day short course in the areas of geometric measure theory (GMT) and varifolds (generalized submanifolds) aimed at analysis students and others interested in geometric analysis on varifolds. Following this will be a fourth day featuring 6-8 talks on applications in GMT, such as the simplicial multi-scale flat norm, computational approaches to varifolds, and branched optimal transport. This course is well suited to students and faculty interested in analysis, differential geometry, variational analysis, and their applications.

Monday, July 9

9:00 a.m. [Rectifiable Sets and the Area & Coarea Formulas](#) S.K.
10:30 a.m. Break
11:00 a.m. [Sets of Finite Perimeter](#) S.K.
12:30 p.m. Lunch
2:30 p.m. [Varifolds](#) S.K.
4:00 p.m. Break
4:30 p.m. [Locally Lipschitz Functions on Rectifiable Varifolds](#) S.K.
6:00 p.m. Wrap-up

Tuesday, July 10

9:00 a.m. [First Variation of a Varifold](#) S.K.
10:30 a.m. Break
11:00 a.m. [Monotonicity Identity](#) S.K.
12:30 p.m. Lunch
2:30 p.m. [Isoperimetric Inequality & Sets of Finite Perimeter on Varifolds](#) U.M.
4:00 p.m. Break
4:30 p.m. [Weakly Differentiable Functions on Varifolds I](#) U.M.
6:00 p.m. Wrap-up

Wednesday, July 11

9:00 a.m.	Weakly Differentiable Functions on Varifolds II	U.M.
10:30 a.m.	Break	
11:00 a.m.	Sobolev Functions on Varifolds	U.M.
12:30 p.m.	Lunch	
2:30 p.m.	Second-order Elliptic PDEs on Varifolds I	U.M.
4:00 p.m.	Break	
4:30 p.m.	Second-order Elliptic PDEs on Varifolds II	U.M.
6:00 p.m.	Wrap-up	

Thursday, July 12

9:00 a.m.	Varifolds and Motion of Surfaces by Crystalline Curvature	Jean Taylor
9:45 a.m.	Flows for Branched Optimal Transport	Carol Downes
10:30 a.m.	Break	
11:00 a.m.	Computing Integral Currents	Sharif Ibrahim
11:45 a.m.	Median Shapes	Yunfeng Hu
12:30 p.m.	Lunch	
2:30 p.m.	Anisotropic Counterpart of Allard's Rectifiability Theorem	Antonio De Rosa
3:15 p.m.	One-Dimensional Rectifiable Varifolds and Some Applications	Robert Hardt
4:00 p.m.	Break	
4:30 p.m.	Ramified Optimal Transportation and its Applications	Qinglan Xia
5:15 p.m.	Properties of Total Variation Minimizers	William K. Allard*
6:00 p.m.	Wrap-up	

Organizing Committee:

Enrique Alvarado, Chair, Washington State University–Pullman

Laramie Paxton, Co-chair**, Washington State University–Pullman

Benjamin Parker, Portland State University

Wayne Wakeland, Portland State University

Kevin R. Vixie, Washington State University–Pullman

Bala Krishnamoorthy, Washington State University–Vancouver

There is no registration fee for the seminar. **Please contact Laramie Paxton at realtimemath@gmail.com to register for the seminar and for assistance with travel arrangements or general questions. The following will be provided during the talks: tea, coffee, sugar, milk, and almond milk. See www.analysisplusdata.community for more information. A campus map is included below.

*Tentative



Figure 1: Map of PSU campus. The red star is the SRTC and the blue dots are parking garages. The classroom B1-82 is in the basement of the SRTC, which is located at the corner of SW 10th Ave. and SW Mill St. near Downtown Portland: 1719 SW 10th Ave, Portland, OR 97201.