

# ALTA

Institute for Algebra, Geometry,  
Topology and their applications

## APPLIED AND COMPUTATIONAL ALGEBRAIC TOPOLOGY

July 15 - 19, 2013

University of Bremen

### Monday, July 15, 2013

- 08:50–09:00 Opening of the conference
- 09:00–09:50 **Herbert Edelsbrunner**  
Sampled dynamical systems
- 10:00–10:50 **Paul Bendich**  
Towards statistics on vineyards with fuzzy Frechet means
- coffee break
- 11:20–12:10 **Rick Jardine**  
Homotopy theories of dynamical systems
- lunch break
- 14:00–14:50 **Dmitriy Morozov**  
Back to basics: merge trees
- coffee break
- 15:20–16:10 **Eric Goubault**  
Determination of tree spaces, and the geometric nature of synchronisation
- 16:20–16:50 **Daniel Müllner**  
Stability of levelset zigzag persistence and discretized Reeb graphs
- 16:50–17:20 **Justin Curry**  
Persistent homology via cellular cosheaves

## Tuesday, July 16, 2013

- 09:00–09:50 **Michael Farber**  
Geometry and topology of random 2-complexes
- 10:00–10:50 **Roy Meshulam**  
Topology and combinatorics of Ramanujan complexes
- coffee break
- 11:20–11:50 **Kevin Knudson**  
Syzygies and multi-dimensional persistence
- 11:50–12:20 **Vitaliy Kurlin**  
A persistence-based reconstruction of homotopy types  
of graphs from noisy samples in the plane
- lunch break
- 14:00–14:50 **Martin Raussen**  
Spaces of directed paths as simplicial complexes
- coffee break
- 15:20–15:50 **Claudia Landi**  
A bridge between continuous and discrete multidimen-  
sional persistent homologies
- 15:50–16:20 **Lisbeth Fajstrup**  
Cut-off theorems in PV-models, a geometric approach
- 16:30–18:00 **ACAT Board Meeting**
- 19:30 **Conference dinner – Ratskeller Bremen**

## Wednesday, July 17, 2013

09:00–09:50 **Graham Ellis**  
Applied computational group theory?

10:00–10:50 **Vin de Silva**  
Persistent cohomology and the topological analysis of  
recurrent signals

coffee break

11:20–12:10 **Neza Mramor Kosta**  
Birth and death in discrete Morse theory

lunch

**Excursion:**  
**Auswandererhaus / German Emigration Center**

## Thursday, July 18, 2013

- 09:00–09:50 **Peter Bubenik**  
Metrics on diagrams and persistent homology
- 10:00–10:50 **Frederic Chazal**  
Optimal rates of convergence for persistence diagrams  
in topological data analysis
- coffee break
- 11:20–11:50 **Sanjeevi Krishnan**  
Higher dimensional flow-cut dualities
- 11:50–12:20 **Thomas Kahl**  
On topological abstraction of higher dimensional  
automata
- lunch break
- 14:00–14:50 **Dominique Attali**  
Collapsing Rips complexes for shape reconstruction in  
high dimensions
- coffee break
- 15:20–16:10 **Matthew Kahle**  
Topology of random flag complexes
- 16:20–16:50 **Sefi Ladkani**  
Derived categories arising from combinatorial data
- 16:50–17:20 **Hubert Wagner**  
Persistent homology in text mining

## Friday, July 19, 2013

- 09:00–09:50 **Facundo Memoli**  
Curvature sets over persistence diagrams
- 10:00–10:50 **Patrizio Frosini**  
Adapting persistent homology to invariance groups
- coffee break
- 11:20–12:10 **Lucile Vandembroucq**  
On topological complexity and related invariants
- lunch

# Participants

<b>Dominique Attali</b>	CNRS Grenoble, France
<b>Paul Bendich</b>	Duke University, USA
<b>Magnus Botnan</b>	NTNU Trondheim, Norway
<b>Peter Bubenik</b>	Cleveland State University, USA
<b>Frederic Chazal</b>	INRIA, France
<b>Justin Curry</b>	University of Pennsylvania, USA
<b>Herbert Edelsbrunner</b>	IST Austria, Austria
<b>Graham Ellis</b>	National University of Ireland, Ireland
<b>Lisbeth Fajstrup</b>	Aalborg University, Denmark
<b>Michael Farber</b>	University of Warwick, UK
<b>Massimo Ferri</b>	University of Bologna, Italy
<b>Patrizio Frosini</b>	University of Bologna, Italy
<b>Eric Goubault</b>	CAE Saclay, France
<b>Rick Jardine</b>	University of Western Ontario, Canada
<b>Thomas Kahl</b>	University of Minho, Portugal
<b>Matthew Kahle</b>	Ohio State University, USA
<b>Kevin Knudson</b>	University of Florida, USA
<b>Marek Krcal</b>	Charles University, Czech Republic
<b>Sanjeevi Krishnan</b>	University of Pennsylvania, USA
<b>Vitaliy Kurlin</b>	Durham University, UK
<b>Catherine Labruère</b>	University of Bourgogne, France
<b>Sefi Ladkani</b>	University of Bonn, Germany
<b>Claudia Landi</b>	University of Modena, Italy
<b>Facundo Memoli</b>	University of Adelaide, Australia
<b>Roy Meshulam</b>	Technion, Israel
<b>Dmitriy Morozov</b>	LBNL, USA
<b>Neza Mramor Kosta</b>	University of Ljubljana, Slovenia
<b>Daniel Müllner</b>	Stanford University, USA
<b>Martin Raussen</b>	Aalborg University, Denmark
<b>Vin de Silva</b>	Pomona College, USA
<b>Lucile Vandembroucq</b>	University of Minho, Portugal
<b>Hubert Wagner</b>	Jagiellonian University, Poland