

DGD Days 2017: Workshops & Discussion Groups			
Wednesday, October 4 th			Theme
4	Myfanwy Evans John Sullivan	A12	<p>Geometry of a double helix</p> <p>Examining literature on the ideal geometry of the symmetric double helix alongside symmetry breaking and computation explorations. We will then explore physical modelling of helical tubes in solution under differing conditions and the geometry that results. We hope to then start a discussion on the relevance of this topic to the A12 project as a whole.</p>
6	Felix Kraemer	C02	<p>Analog-to-digital conversion as a dynamical system</p> <p>In Sigma-Delta modulation, digital representations of data are constructed via a non-linear dynamical system. The stability of this system is of direct importance for the resulting error bounds. The goal will be to study this system from the viewpoint of dynamical systems, hopefully improving results by combining expertise from different areas.</p>
9	Ulrich Bauer Herbert Edelsbrunner	C04	<p>Delaunay triangulations and circular nets</p> <p>The goal of the discussion group is to build bridges between the theories of integrable surfaces (circular, conical, contact element nets) and of Delaunay triangulations. In particular, we want to develop ideas for a setting of discrete surfaces in which the case of circular nets appears as a distinguished optimal special case, making it possible to optimize general discrete surfaces towards this property. Specifically, the vertices in a circular net are locally in special (degenerate) position with respect to the Delaunay construction, providing a link between the fundamental definitions of both theories. We want to explore ideas and consequences of this connection. A possibly related question is the construction of discretized pair-potential energies based on the Delaunay construction.</p>
10	Jürgen Richter-Gebert Michael Strobel Aaron Montag	Z02	<p>Workshop on CindyJS: Software Demo, possibilities and applications.</p>
11	All	All	<p>Work in Groups: time for project collaborations</p> <p>This choice of workshop gives those involved in transregio projects the opportunity to work together on their common topics.</p>

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Thursday, October 5 th			Theme	Ca. Participants
3	Robert Loewe Manuel Radons	A11	<p>Polymake Workshop</p> <p>An interactive demonstration of the software “polymake” illuminating the application of polymake in diverse aspects of discrete differential geometry and related work in progress in project A11.</p>	5
2	Ulrich Pinkall Gero Friesecke	A05, B08	<p>Geometry and Elasticity</p> <p>Deformations of volumes, surfaces or curves (both continuous and discrete) that minimize some elastic energy play an important role in Geometry as well as in many application areas.</p> <p>A certain special elastic energy that goes back to work of people in the Munich branch of our SFB has been used by people in the Berlin branch in order to develop efficient numerical methods for handling (discretized) elasticity in the context of Computer Graphics. It then came as a surprise that in the two-dimensional case equilibria this special energy can even be explicitly described in terms of a Weierstrass representation similar to the one that is well-known for minimal surfaces.</p> <p>Elastic equilibria for configurations of discrete atoms are studied in Munich. Lattice defects that occur in this context also show up in optimal stripe patterns on surfaces that were studied in Berlin.</p> <p>The goal of the workshop is to provide a forum for exploring possible common elasticity-related interests among various work groups in the SFB</p>	16 - 18
8	Gitta Kutyniok Sandra Keiper Philipp Petersen <i>+ Friday, October 6th</i>	C03	<p>Approximation with Deep Neuronal Networks</p> <p>Session 1: * Introduction into Approximation with Deep Neural Networks also touching applications to inverse problems/PDE solvers. * Suggestion of several research directions / topics for discussion (by us). * Start of discussion</p>	Do.: 14 – 16 Fr.: 12 - 14
11	All	All	<p>Work in Groups: time for project collaborations</p> <p>This choice of workshop gives those involved in transregio projects the opportunity to work together on their common topics.</p>	

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Friday, October 6 th			Theme	Ca. Participants
8	Kutyniok, Keiper, Petersen	C03	Approximation with Deep Neuronal Networks Session 2: Recap of previous day and continuation of the discussion.	12 - 14
7	Felix Kraemer Ulrich Bauer	C02, C04	Topological data analysis and signal processing This workshop shall explore the interface between topological methods and signal processing approaches. Topics include: How do topological signatures behave under sampling and analog-to-digital conversion? What happens to them under random projections? This will connect projects C02 and C04.	10 - 12
1	Ulrike Bücking Boris Springborn	A01	Dimer models and discrete complex analysis 3 Talks	14 - 16
5	Oliver Junge Daniel Karrasch	B09	Dynamically induced geometric heat flows We would like to discuss aspects related to the evolution of probability densities by a geometric heat equation defined on the evolving Riemannian manifold of initial conditions of a dynamical system. The discussion group will start with two introductory talks (by the organizers), followed by an open discussion of research questions, and new associations and connections to the participants' research interests.	9
11	All	All	Work in Groups: time for project collaborations This choice of workshop gives those involved in transregio projects the opportunity to work together on their common topics.	