

离散几何分析研讨会 Day 2

时间：2021年7月4日（星期日）

上午 8:00-11:20，下午 1:00-3:30

地点：腾讯会议在线

主办单位：清华大学，中国科学技术大学，南京信息工程大学，复旦大学

主人：林勇（清华大学）；刘世平（中国科学技术大学）；黄学平（南京信息工程大学）；华波波（复旦大学）

	7月4日（周日）	主持人
上午 8:00-8:40	侯松波	刘世平
8:50-9:30	赵亮	
9:50-10:30	解媛媛	白淑亮
10:40-11:20	王俊	
下午 1:00-1:40	王龙敏	黄学平
1:50-2:30	孙林林	
2:50-3:30	周泽	

报告题目: Existence of solutions to Chern-Simons-Higgs equations on graphs

报告人: 侯松波

报告人所在单位: 中国农业大学

报告摘要: In this talk, we discuss the existence of solutions to a generalized Chern-Simons-Higgs equations on graphs. We also discuss the existence of solutions to the Chern-Simons-Higgs equation, which completes the results of An Huang, Yong Lin and Shing-Tung Yau (Commun. Math. Phys. 377, 613-621 (2020)).

报告题目: Existence and Convergence for Schrödinger type equations on graphs

报告人: 赵亮

报告人所在单位: 北京师范大学

报告摘要: In this talk, we focus on several Schrödinger type equations on locally finite graphs. Firstly, we will introduce some preliminaries and basic settings for calculus of variation on graphs. The main contribution of this talk is to propose some results about the existence and convergence of solutions for these equations. In addition, we will also provide a numerical experiment to illustrate the results.

This talk is based on the joint work with Han X.L., Shao M.Q. and Zhang N.

报告题目: Semilinear heat equations and parabolic variational inequalities on graphs

报告人: 解媛媛

报告人所在单位: 中国人民大学

报告摘要:

Let $G = (V, E)$ be a locally finite connected weighted graph, and Ω be an unbounded subset of V . Using Rothe's method, we study the existence of solutions for the semilinear heat equation $\partial_t u + |u|^{p-1} \cdot u = \Delta u$ ($p \geq 1$) and the parabolic variational inequality

$$\int_{\Omega^\circ} \partial_t u \cdot (v - u) d\mu \geq \int_{\Omega^\circ} (\Delta u + f) \cdot (v - u) d\mu \quad \text{for any } v \in \mathcal{H},$$

where $\mathcal{H} = \{u \in W^{1,2}(V) : u = 0 \text{ on } V \setminus \Omega^\circ\}$.

报告题目：Mean field equation and Relativistic Abelian Chern- Simons Model on finite Graph

报告人：王俊

报告人所在单位：江苏大学

报告摘要：In this talk we study the mean field equation and the relativistic Abelian Chern-Simons equations (involving two Higgs particles and any two gauge fields) on the finite connected graph. For the former equation we establish the existence results and some uniqueness result. Particularly, we find out that there is no set of critical parameters for the mean field equation on the finite graph and existence is ensured for any non-negative parameters, which is in contrast to the continuous case. In addition, we give the optimal constant which is the threshold for the uniqueness of the equation on the finite complete graph with simple weight, a key observation is that the solution can take two values at most. While for the second problem, we study the existence of maximal condensates, and also establish the existence of multiple solutions, including a local minimizer for the transformed energy functional and a mountain-pass type solution. This joint work with H.-Y. Huang and W. Yang.

报告题目：Green Functions and Branching Random Walks on Hyperbolic Spaces

报告人：王龙敏

报告人所在单位：南开大学

报告摘要: Let Γ be a group acting geometrically on a proper geodesic hyperbolic space X . Fix a superexponential symmetric probability μ on Γ whose support generates Γ as a semigroup. We will consider the critical behavior of the growth rate for the Green function of the random walk on X with step distribution μ , and its relation to the Hausdorff dimension of the limit set for the corresponding branching random walk. Based on joint work with Vladas Sidoravicius and Kainan Xiang.

报告题目: Brouwer degree for Kazdan-Warner equations on a connected finite graph

报告人: 孙林林

报告人所在单位: 武汉大学

报告摘要: We study Kazdan-Warner equations on a connected finite graph via the method of the degree theory. Firstly, we prove that all solutions to the Kazdan-Warner equation with nonzero prescribed function are uniformly bounded and the Brouwer degree is well defined. Secondly, we compute the Brouwer degree case by case. As consequences, we give new proofs of some known existence results for the Kazdan-Warner equation on a connected finite graph.

报告题目: Producing circle patterns via configurations

报告人: 周泽

报告人所在单位: 湖南大学

报告摘要: In this talk, we consider circle patterns from the viewpoint of configurations. By using the topological degree theory, we extend the Koebe-Andreev-Thurston Theorem to include circle patterns with obtuse exterior intersection

angles. As a consequence, we obtain a generalization of Andreev's Theorem which allows obtuse dihedral angles.