

# ANALYTIC ASPECTS OF CHERN-SIMONS THEORY

March 14, 2013, 9:30am - 3:30 pm

Science Center, Room 4102

Graduate Center, CUNY

## Schedule:

- 9:30 - 10:30 Coffee
- 10 am - 11 am: Gabriella Tarantello (Rome II)
- 11:15 am - 12:15 pm: Dan Spirn (Minnesota)
- 12:15 pm - 1:15 pm: Lunch break
- 1:15 pm - 2:15 pm: Zheng-Chao Han (Rutgers)
- 2:30 pm - 3:30 pm: Jyotsna Prajapat (Abu Dhabi)
- 3:30 pm - 4:30 pm: Discussion

## Title and Abstract:

1. Gabriella Tarantello :

*Title: On singular Liouville systems in the study of non-Abelian Chern-Simons vortices*

Abstract: We describe some recent results about entire solutions for a class of singular Liouville systems and show their role in the construction on non-abelian vortices of non-topological type.

2. Dan Spirn:

*Title: Vortices in the Maxwell-Chern-Simons-Higgs Equations*

Abstract: We discuss static and dynamic properties of electrically and magnetically charged vortex solutions in the full Chern-Simons-Higgs theory for which both the Maxwell term and Chern-Simons term are present in the Lagrangian density.

## 3. Zheng-Chao Han:

*Title: Asymptotic behavior of solutions to the  $\sigma_k$ -Yamabe equation near isolated singularities*

Abstract:  $\sigma_k$ -Yamabe equations are conformally invariant equations generalizing the classical Yamabe equation. YanYan Li proved earlier that an admissible solution with an isolated singularity at 0 in  $R^n$  to the  $\sigma_k$ -Yamabe equation is asymptotically radially symmetric. In this joint work with YanYan Li and Eduardo Teixeira, we prove that such a solution is asymptotic to a radial solution to the same equation on  $R^n \setminus \{0\}$ . These results generalize earlier pioneering work in this direction on the classical Yamabe equation by Caffarelli, Gidas, and Spruck. I will describe some ingredients used to prove the asymptotic results.

## 4. Jyotsna Prajapat:

*Title: Uniqueness of topological solutions for a Chern Simons model with two Higgs fields and two Gauge fields on a Torus*

Abstract: We show that the topological solutions of the Chern-Simons system coincides with the maximal solutions for all small values of the coupling parameter  $1/\lambda$ . It is known that a similar result holds for the scalar equation on a Torus. Here we will discuss the similarities as well as the difficulties in proving the result for the system.

## Organizers:

- Zeno Huang, CUNY-CSI,  
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- Marcello Lucia, CUNY-CSI,  
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