# Scientific Report

For a period of two weeks (5 May – 15 May 2013) I was a visitor in the Institute for Mathematics at University of Zürich. The purpose of the visit was to collaborate with Prof. Thomas Kappeler on the subject of random complexes and, more broadly, Stochastic Topology.

The recent theory of random complexes is part of the larger emergent field of Stochastic Topology. This is a recent area of research including/intersecting topics such as topological data analysis, shape analysis, topological robotics, learning theory and others. The increasing number of applications of these topics requires the development of original mathematical tools as well as adapting well established concepts and theories to solve the new problems arising.

During this visit we discussed a new model for random simplicial complexes. The new model generalizes previous models in the literature such as the Linial-Meshulam model for random simplicial complexes [1] and the model of random clique complexes [2].

This discussion also Prof. Michael Farber, at the time also visiting the Institute. I believe we will be able to contribute with original results to the area in the near future.

Dr. Armindo Costa
May 20, 2013

**[1] -** Nathan Linial and Roy Meshulam, Homological connectivity of random 2-complexes, Combinatorica 26 (2006), no. 4, 475–487.
**[2]-** Matthew Kahle, Topology of random clique complexes, Discrete Math. 309 (2009), no. 6, 1658–1671.