Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Nonperturbative Renormalization Group Approach to Polymerized Membranes KARIM ESSAFI, Okinawa Inst of Sci & Tech, JEAN-PHILIPPE KOWNACKI, Univeristy of Cergy-Pontoise, DOMINIQUE MOUHANNA, University Pierre and Marie Curie — Membranes or membrane-like materials play an important role in many fields ranging from biology to physics. These systems form a very rich domain in statistical physics. The interplay between geometry and thermal fluctuations lead to exciting phases such flat, tubular and disordered flat phases. Roughly speaking, membranes can be divided into two group: fluid membranes in which the molecules are free to diffuse and thus no shear modulus. On the other hand, in polymerized membranes the connectivity is fixed which leads to elastic forces. This difference between fluid and polymerized membranes leads to a difference in their critical behaviour. For instance, fluid membranes are always crumpled, whereas polymerized membranes exhibit a phase transition between a crumpled phase and a flat phase. In this talk, I will focus only on polymerized phantom, *i.e.* non-self-avoiding, membranes. The critical behaviour of both isotropic and anisotropic polymerized membranes are studied using a nonperturbative renormalization group approach (NPRG). This allows for the investigation of the phase transitions and the low temperature flat phase in any internal dimension D and embedding d. Interestingly, graphene behaves just as a polymerized membrane in its flat phase.

Karim Essafi
Okinawa Inst of Sci & Tech

Date submitted: 15 Nov 2013 Electronic form version 1.4