On cluster algebras and topological string theory

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Stellingen

behorende bij het proefschrift

On cluster algebras and topological string theory

1. The XXZ spin chain is isomorphic to a cluster integrable system of rectangular Newton polygons [chapter 2].

2. The solution of the tetrahedron equation by Bazhanov and Sergeev has a cluster-algebraic origin. This observation greatly generalizes the class of integrable systems that can be constructed using this solution [chapter 3].

3. The counting of three-dimensional boxes by dimers on a hexagonal lattice can be generalized to general bipartite graphs [chapter 4].

4. The viscosity of electrons in graphene can be measured in AC electrical conduction [chapter 5].

5. Two-dimensional viscous flows of strongly interacting electrons in a channel create vortices. Depending on the boundary conditions, there appears either a vortex pair or an infinite vortex train.

6. The claim by Putzke *et al.* [Science **368**, 1234 (2020)] that the phase coherence length in their magnetoconductance experiment exceeds 10 μm is not supported by a semiclassical interpretation of their data.

7. Majorana zero-modes do not respond to electric or magnetic force fields, but they can be manipulated by means of the Magnus force.

8. Tangent fermions, massless fermions on a space-time lattice with a dispersion relation $\tan^2(E/2) = \sum_\alpha \tan(k_\alpha/2)$ in dimensionless units, solve all but one of the problems inherent with the discretization of the Dirac equation.

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