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Integrable dynamics on polygons and the dimer integrable system

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On the one hand, several discrete-time dynamical systems on spaces of polygons have been shown in the last twenty years to be integrable. On the other hand, Goncharov and Kenyon introduced ten years ago an integrable system associated with the dimer model on bipartite graphs on the torus. Building upon the notion of triple crossing diagram maps (introduced in recent works of Affolter, Glick, Pylyavskyy and myself), I will describe a framework which encompasses both the geometric dynamics on polygons and the dimer integrable system. This framework makes it possible in particular to identify the conserved quantities of both systems. I will illustrate this paradigm on the example of the pentagram map.

This talk is based on joint works with Niklas Affolter (TU Vienna), Terrence George (UCLA), Max Glick (Google) and Pavlo Pylyavskyy (University of Minnesota).

Orateur: RAMASSAMY, Sanjay (IPhT)