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Valentin Ovsienko (ovsienko@math.univ-lyon1.fr), CNRS, Institut Camille Jordan, University Lyon 1, 69622 Villeurbanne, France, **Richard Schwartz**, Department of Mathematics, Brown University, Providence, RI 02912, and **Sergei Tabachnikov*** (tabachni@math.psu.edu), Department of Mathematics, Penn State, University Park, PA 16802. *Quasiperiodic motion for the pentagram map.*

The pentagram map is a projectively natural iteration defined on polygons, and also on more general objects called twisted polygons. We find a Poisson structure on the space of twisted polygons and show that the pentagram map relative to this Poisson structure is completely integrable in the sense of Arnold-Liouville. For certain families of twisted polygons, such as universally convex ones, the integrability implies the quasi-periodic motion for the dynamics of the pentagram map. The pentagram map is closely related to the octahedral recurrence and is a discrete version of the well known completely integrable PDE, the Boussinesq equation. (Received January 29, 2009)