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**Gloria Mari-Beffa\*** ([maribeff@math.wisc.edu](mailto:maribeff@math.wisc.edu)), Van Vleck Hall, 480 Linden drive, Madison, WI 53705, and **Annalisa Calini**. *Twisted polygonal evolutions in  $\mathbb{RP}^m$  and discretizations of Adler-Gel'fand-Dikii flows.*

In this talk we will describe a recently found discretization of a well known completely integrable system of PDEs (the Adler-Gel'fand-Dikii flow, due to Adler). To define the differential-difference system and to show the discretization is itself completely integrable we will link it to polygonal evolutions in  $\mathbb{RP}^m$  and to their background geometry. This relationship will allow us to define Hamiltonian structures for the system, and to prove that they are compatible and can be used to generate integrals of the motions (i.e., it is Liouville integrable). This is joint work with Annalisa Calini and Jin Ping Wang. (Received August 31, 2019)