Polytope Exchanges as compactifications
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I will describe a family of polytope exchange transformations which I call double lattice PETs. These are maps which are defined in terms of a pair of incommensurable Euclidean lattices. I will explain how these maps arise as compactifications of some infinite polygon- and intervel- exchange transformations related to outer billiards and other geometric constructions. After explaining some general results, I'll concentrate on the case of outer billiards on the Penrose kite. In this case there is a 3D compactification which admits a renormalization scheme.