Flexing the 1-skeleton of a Penrose tiling

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A (planar) framework – a graph together with a map of its vertices to the plane – is flexible if it allows a continuous deformation preserving the distances between adjacent vertices. In 2021, Grasegger and Legerský proved that any framework where every 4-cycle is a parallelogram (known as a P-framework) will be flexible if and only if it its ribbon graph is disconnected. I will discuss how this result can be extended to P-frameworks with infinitely many vertices, and to P-frameworks with n-fold rotational symmetry. I will also discuss how this can then be applied to a special class of infinite P-framework; those formed from the 1-skeleton of a Penrose rhombus tiling with a given set of braced rhombi, possibly with 5-fold rotational symmetry. The talk is based on joint work with Jan Legerský.

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