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Reza Sarhangi* (rsarhangi@towson.edu), Department of Mathematics, Towson University,
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This presentation is about methods for tiling the surfaces of some star polygons that are constructed using a $(10, 3)$ star polygon. Based on this star polygon we are able to construct two stars that are used in many traditional Persian tiling: a five-pointed and a ten-pointed star. For convenience we will call them a pentagram (that is different from a $(5, 2)$ star polygon, which is usually called a pentagram) and a decagram. A pentagram can be constructed using the intersections of segments that constitute a $(10, 3)$ star polygon. It can also be generated by the rotation of a 72 degrees rhombus rotating around the vertex of the 72 degrees angle. A decagram can be constructed using a $(10, 3)$ star polygon. It also can be created through the rotation of two concentric, congruent regular pentagons with a radial distance of 36 degrees from each other's central angles. We study the creations of decorative pentagrams and decagrams that are covered by different sets of motifs (polyhedral tessellations) with the conditions that: (a) the tessellations have 5 or 10-fold rotational symmetry, and (b) the vertices of the main frames of the tessellations are located at the center of the small decagram motifs that constitute the tiling. (Received September 03, 2013)