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Reza Sarhangi* (rsarhangi@towson.edu), Towson University, Department of Mathematics,
8000 York Road, Towson, MD 21252. *Polyhedral Modularity in a Special Class of Decagram Based
Interlocking Star Polygons*. Preliminary report.

The main effort in this presentation is to study a series of Persian mosaic designs that have been illustrated in scrolls or decorated the surfaces of ancient structures. The common element for the course of study in these designs is a special ten pointed star polygon. This special concave polygon, which is called a decagram for convenience, is the dominant geometric shape of a series of polyhedral tessellations that all consist of the same common motifs. The decagram can be created through the rotation of two concentric congruent regular pentagons with a radial distance of 36° from each others' central angles. However, to create a decagram-based interlocking pattern, a craftsman-mathematician needs to take careful steps to locate a fundamental region. The rectangular-shaped fundamental regions, which are constructed using radial grids, have different proportions for their dimensions. This presentation includes a few patterns that are considered aperiodic (quasiperiodic) tillings, in the language of modern mathematics. (Received September 02, 2011)