Spherical Tilings of Folding Type

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In this talk, we present some recent progress in a tiling problem and review its lineage of differential geometry and topology. The tilings in question are known as tilings of folding type, or f-tilings for short. Examples on the sphere, as singularities of isometric foldings, first appeared in S. A. Robertson's 1977 paper on isometric foldings of Riemannian manifolds. We will explain two open problems originated from this result. Meanwhile, as a specific class of spherical tilings, f-tilings have a connection to the Möbius triangles as we reveal in our case study. Edge-to-edge tilings by Möbius triangles give rise to the geometric realisations of the triangle groups (examples of Coxeter group). Using this very connection, we obtain an algorithm to enumerate the f-tilings in our studies. This is a joint-work with Catarina Avelino and Altino Santos at The Centre of Mathematics, University of Trás-os-Montes and Alto Douro, Portugal.