

# A brief introduction to Network Geometry

Marián Boguñá<sup>a,b</sup>

<sup>a</sup> Department of Condensed Matter Physics, Universitat de Barcelona

<sup>b</sup> Universitat de Barcelona Institute of Complex Systems (UBICS)

**Abstract.** The main hypothesis of network geometry states that the architecture of real complex networks has a geometric origin. The nodes of complex networks can be characterized by their positions in an underlying metric space so that the observable network topology—abstracting their patterns of interactions—is then a reflection of distances in this space. This simple idea led to the development of a very general framework able to explain the most ubiquitous topological properties of real networks, namely, degree heterogeneity, the small-world property, and high levels of clustering. Network geometry is also able to explain in a very natural way other non-trivial properties, like self-similarity and community structure, their navigability properties, and is the basis for the definition of a renormalization group in complex networks. In this talk, I will give a brief introduction to this exciting topic and I will highlight some of the most interesting applications.