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Abstract for an Invited Paper
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Communities, boundaries and symmetries - Hidden structures in multi-scale human mobility networks
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Geographical boundaries are key determinants of various spatially extended dynamical phenomena. Examples are migration dynamics of species, the spread of infectious diseases, bioinvasive processes, and the spatial evolution of language. I will give an overview of a set of research projects that address the organizational units encoded in multi-scale human mobility networks. I will show how these networks can be employed to introduce, define and quantify large scale communities and their boundaries that only partially coincide with administrative and political ones. I will show how common modularity measures can be used to identify these structures and will discuss an alternative approach based on a new notion of distance in human mobility. I will conclude with a discussion of the discovery of novel symmetries in multi-scale mobility networks and point out a new coordinate system for representing complex mobility networks.