



Entropy, Complexity and Spatial Dynamics: A Rebirth of Theory?

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Spatial and socio-economic systems are comprised of heterogeneous components that self-organize and generate theoretically nontrivial morphological structures and behaviors. There are theoretical indications (e.g. by means of entropy theory) that the extent of heterogeneity affects significantly the system's structure and dynamic behavior and that the system's coherent spatial organization is maintained by local interactions, adaptation, information sharing and learning. Unlike theoretical analyses of these systems, empirical studies are marred by absence of agreed upon definition of boundaries of the various settlement types and by the utilization of arbitrary, time- and space -dependent measures of various characteristics of the systems to test hypotheses. Data based on different definitions of boundaries and cross-sectional analyses at various stages of systems' evolutions make comparisons of settlements systems and general inferences concerning dynamics problematic.

Starting from these considerations, this Special Session aims to explore the dynamics of complex systems from fundamental perspectives, such as entropy and spatial economic theories, and to discuss whether these fundamental theories might show new advances, including new empirical insight, at various spatial and time scales. In particular, given the current concerns that Big Data and related data-driven methods and models signal an end to theory, this session is intended to engage that debate, and to investigate the potential and possibilities for complexity science to help revitalize theory in the field of regional science, especially in the era of Big Data.

Consequently, the proposed sessions will include both theoretical and empirical studies of spatial systems subject to non-linear dynamics due to the existence various interactions. In particular, we welcome studies that incorporate physical and socio-economic characteristics of individual and systems of cities, towns and villages, and their reactions to significant shocks to places and to people by incorporating strong and weak forces. It is our intention that the papers in these sessions will reach beyond qualitative generalizations and contribute to the identification of nontrivial and true quantitative laws of spatial economic systems.