ENGINEERING SCIENCES & APPLIED MATH--FEATURED SPEAKER

Scaling in Physics, Biology, Cities and Beyond

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M416 (ESAM Conference Room), Tech

General scaling theory and its application in physics, biology and social science will be summarized, followed by a discussion of urban scaling and its relation to the universality and self-similarity lurking in the urban systems. On the one hand, the dynamics of cities are so complex so as to defy simple explanation. Urban characteristics, geographic factors and historical paths are so entangled that even a well-designed plan often results in unintended consequences. This high level of complexity contradicts the universality and self-similarity that we observe in almost every aspect of cities (population distribution, crime rate, productivity and even economic diversity) because they imply the underlying dynamics are reducible to a simple form. On the other hand, universality is a natural, and even trivial, consequence derived from a common set of functionalities of cities. People share reasons to move to cities: more interaction, greater opportunity, higher productivity and better infrastructure. These basic dynamics of urbanization are manifested as a strong signal of universality and self-similarity under a single scaling law.

Note: Cookies will be served at 3:30