Evolutionary Design with Freedom

Palestrante: Prof. Dr. Adrian Bejan.

Instituição: Duke University. Carolina do Norte, Estados Unidos.

Data: 27/11 das 14h às 14h50

Resumo da palestra: Evolution is the defining phenomenon of nature. This lecture outlines the role played by freedom and evolution in physics (thermodynamics): given freedom, movement exhibits the tendency to evolve into configurations that provide greater access. The lecture traces the modern evolution of flow systems that morph with freedom toward greater flow access, in accord with the constructal law. For example, the evolution of volumetric cooling or heating is pointing toward greater heat transfer density, multiple scales and smaller dimensions. The progress is in two ways, incremental and with sudden step changes in flow configuration and performance. All this is predictable. The doctrine of evolutionary (constructal) design teaches how to predict evolution in general, and how to fast-forward technology evolution. The lecture is based on the new book: FREEDOM AND EVOLUTION: Hierarchy in Nature, Society and Science, Springer Nature, 2020.

Biografia: Adrian Bejan received the Benjamin Franklin Medal (2018) and the Humboldt Research Award (2019) for thermodynamics and the constructal law of natural design and its evolution in nature, society, and science. His degrees are from the Massachusetts Institute of Technology (B.S.1971, M.S.1972, Ph.D.1975). He has authored 690 peer-refereed journal articles and 30 books and has been awarded 18 honorary doctorates from universities in 11countries. He is ranked among the top 0.01% of the most cited and impactful world scientists (and top 10 in Engineering worldwide) in the 2019 citations impact database created by Stanford University's John Ioannidis, in PLoS Biology.