

The Department of Engineering of the University of Sannio has been selected as one of the 180 Italian Departments of Excellence and several internationally renowned scholars will be hosted to further enrich the educational offer.

In this framework, the DING is pleased to welcome Professor Adrian Bejan, world renowned-scientist in the field of Applied Thermodynamics and Thermofluid Dynamics. Generations of researchers around the world have been inspired by his scientific speculation about, amongst other, the Second Law Analysis, the Entropy generation through heat and fluid flow, and the recent, innovative and original Constructal Theory.

Evolutionary Design with Freedom

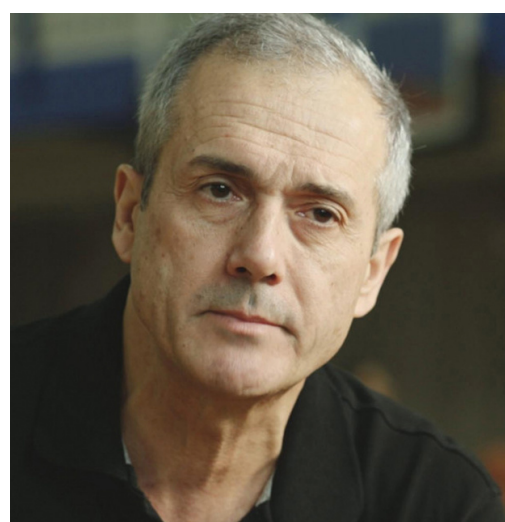
Evolution is the phenomenon of change after change in a discernible direction in time. It is everywhere and unites all of nature and science: bio and non-bio, human made and not human made. The lecture shows how to predict evolution from the physics covered by the constructal law: given freedom, all movement (flow) 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. Topics also include animal locomotion, airplanes, helicopters, organ size, body size, economies of scale, sustainability, population size, and hierarchy. All this is predictable.

The doctrine of evolutionary (constructal) design teaches how to predict evolution in general, and how to fast-forward technology evolution. To predict is 'theory', the ability to imagine, to see with the eyes of the mind, to have original ideas. It is the opposite of 'empiricism' such as copying what exists (biomimicry, technology theft, reverse engineering, plagiarism). The lecture is based on the books:

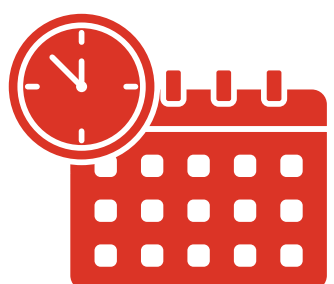
- *Time and Beauty*, 2022;
- *Freedom and Evolution*, 2020;
- *The Physics of Life*, 2016;
- *Design in Nature*, 2012;
- *Design with Constructal Theory*, 2008.

• PROFESSOR ADRIAN BEJAN •



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 11 countries. He is ranked among the top 0.01% of the most cited and impactful world scientists (and top 10 in Engineering worldwide) in the 2021 citations impact database created by Stanford University's John Ioannidis.

• COURSE TIMETABLES •



12 September: from 10:00 to 12:00 and from 14:00 to 17:00.

13 September: from 10:00 to 12:00 and from 14:00 to 17:00.

14 September: from 10:00 to 12:00.

• PARTICIPATION •

The lectures will be held in person at the Sant'Agostino Complex, Via G. De Nicastro 13, Benevento.

To participate, fill in the form: <https://forms.gle/sQnYA4z1sVNTAUVD6>

For more information, please send an email to giopallotta@unisannio.it