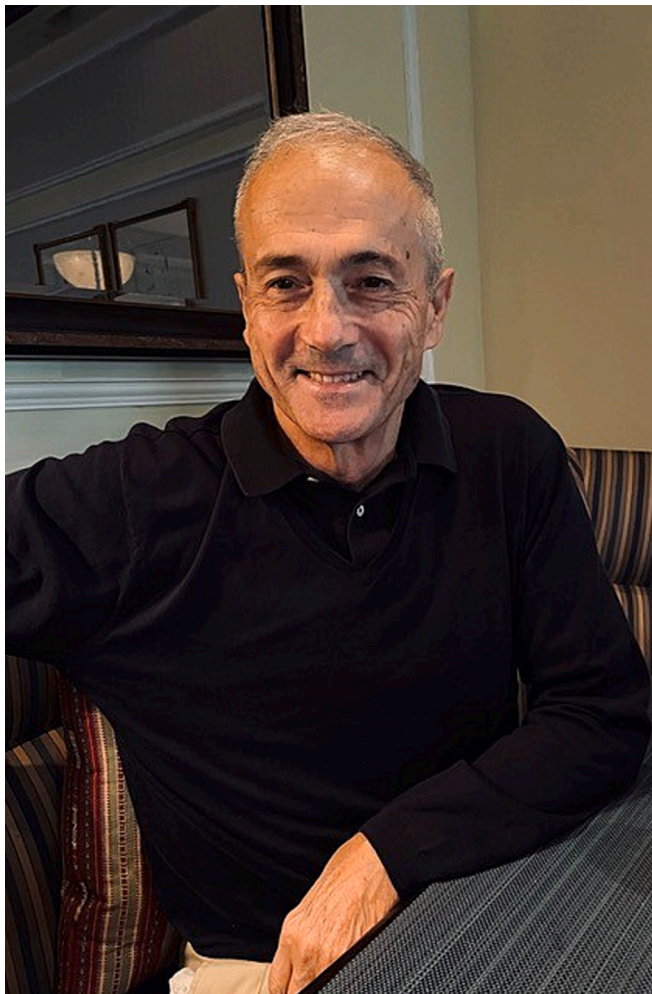


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Professor Adrian Bejan on his 75th birthday



Adrian Bejan's remarkable career is a continuous stream of original ideas that earn him recognition time and again. Detailed assessments of his life and scientific contributions were conducted in 2008 [1] and in 2018 [2]. Most recently, he was honored with the Humboldt Research Award for Lifetime Achievement, Turkish Academy of Sciences Prize (2019), Lifetime Achievement Award (IAGE 2021), Kimberly-Clark Distinguished Lectureship Award (InterPore, 2023), and Nautilus Book

Award Winner 2023 for his book "Time and Beauty" [3].

As we mark his 75th birthday, we celebrate the enduring evolution of an exceptional career characterized by creativity and profound scientific impact, as well as a multitude of groundbreaking scientific methods and designs. What sets Adrian apart is his consistent effort to build bridges between seemingly disparate fields and individuals. He achieves this through brilliant theories and designs that unify and fortify the scientific landscape.

Adrian's pioneering work unified thermodynamics with heat transfer, fluid dynamics, and design. He demonstrated that entropy generation is intrinsically linked to heat transfer and fluid flow with configuration (design) and that the process of design evolution is intimately tied to minimizing entropy generation rate by changing the design of flow systems in a thermodynamics-centered manner. His groundbreaking textbook, "Entropy Generation through Heat and Fluid Flow", published in 1982 by Wiley, laid the foundation for countless articles in heat transfer and thermodynamics journals that now employ Adrian Bejan's Entropy Generation Minimization method for thermodynamic system design.

Moreover, he bridged the gap between human design and design patterns found in nature by unveiling, teaching, and publishing the Constructal Law of evolution, which applies to all systems with the freedom to morph—animate and inanimate, human-made and natural. This paradigm shift replaced the traditional approach of solving differential equations with arbitrarily assumed boundary conditions and introduced the doctrine of design evolution with freedom in all systems that involve flow and movement, encompassing geophysical, biological, technological, and social realms.

The concept of 'boundary conditions' should not be taken for granted; instead, the boundary conditions are the unknowns—the configurations we aim to predict, champion, and employ. Adrian Bejan's inaugural comprehensive textbook on this paradigm shift was published in 2000 as "Shape and Structure, from Engineering to Nature" [4] by Cambridge University Press. It's noteworthy that this approach originated from the realm of engineering, underscoring the emergence of holistic thinking within the scientific community. Furthermore, it highlights the often-overlooked significance of purposeful, directional evolution in deciphering the enigmas of nature and physics.

Adrian's commitment extends to fostering interdisciplinary collaborations, bringing together biologists, physicists, sociologists, economists, managers, athletes, engineers, artists, amateurs, and polymaths. He champions ethics in academia and the protection of intellectual property, actively publishing in peer-reviewed journals and authoring accessible books for a wide audience, particularly young readers: Design in Nature (2012) and The Physics of Life (2016). His crusade for

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interdisciplinary dialogue persists through initiatives like the “12th Constructal Law Conference” (Turin, Italy, 2023) and his widely-used textbooks on thermodynamics, convective heat transfer, and convection in porous media, now in their 4th and 5th editions.

Adrian introduced the predictive power of the Constructal Law to fields such as social organization, government, athletics, history of civilization, warfare, migration, and physics. He unveiled the pivotal role of ‘freedom’ in shaping the evolution of society and the economy towards greater wealth, mobility, hierarchy, and organization. His flagship work, “Freedom and Evolution: Hierarchy in Nature, Society, and Science” (Springer Nature, 2020) [5], has just been translated into Japanese.

Adrian Bejan's creative journey has birthed the new science of design, the physics of form, and the evolutionary narrative of technology and human civilization. His latest book, “Time and Beauty” (2022), delves into the physics of human perceptions and how to practice design with freedom, allure, and enduring appeal. He has pioneered the fields of physics of life and physics of freedom, among others. While his list of accomplishments is impressive, what truly matters is the man himself and his approach to life in science.

Adrian Bejan dedicates his life to science—a relentless pursuit of truth through the scientific method, driven by freedom, fairness, and fearlessness. Visionary thinkers thrive on freedom; they break down barriers and explore uncharted territories. They roam. They explore different (unexpected) fields and discover their own creativity well beyond the topic handed to them by their PhD advisor. Today, we celebrate not only Adrian's numerous achievements and accolades but also the teacher who nurtures, inspires, and guides countless others on their own scientific journeys.

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