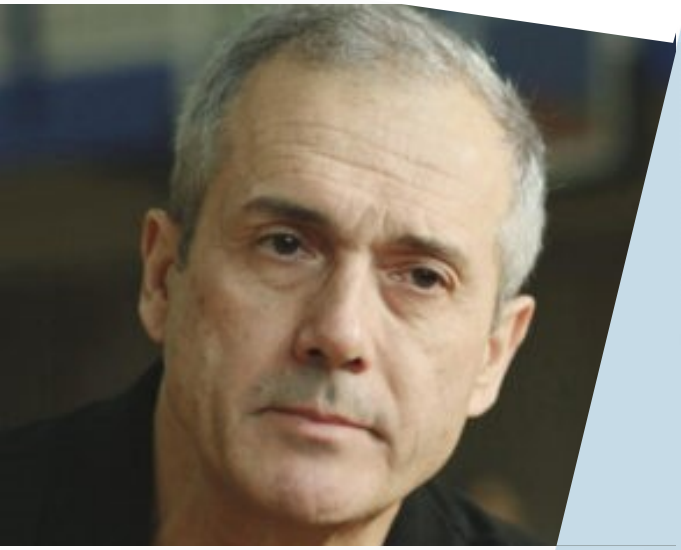
InterPore Foundation

KIMBERLY-CLARK DISTINGUISHED LECTURESHIP AWARD 2023



Lecturer: Prof. Adrian Bejan
J.A. Jones Distinguished Professor of Mechanical Engineering
Duke University, NC, USA

Secure your chance to host Prof. Adrian Bejan at your institute

In-Person
Online
Hybrid

VASCULAR MATERIALS: PREDICTING DESIGN EVOLUTION

His lecture, entitled: Vascular materials: Predicting Design Evolution, will focus on one of his major contributions: evolutionary design illustrated in the case of multiscale vasculature, a methodology that can be used generally to predict the evolution toward flow access, miniaturization, high density of heat transfer, and the scaling up (or down) of an existing design.

Abstract

Porous materials are usually thought of as amorphous mixtures of two or more things, solids, fluids, and voids. The research field started that way, and so did my own activity in it. Along the way, I was drawn to the part of nature (the physics) that was missing from the amorphous view: the structure, flow, configuration, drawing (design), purpose, and evolution.

The lecture is pictorial. It begins with defining the terms, because words have meaning: vascular, design, evolution, and prediction (theory). Next, the lecture shows that vascular (tree shaped) architectures flow more easily than parallel channels with only one length scale (the wall to wall spacing). Transport across channels is facilitated when the spacing is such that the channel flow length matches the entrance (developing) length of the flow.

The tendency to evolve with freedom toward flow configurations that provide greater access is universal in nature, bio, and non-bio. This tendency is the Constructal Law, which empowers us to predict the evolution toward flow access, miniaturization, high density of heat transfer, and the scaling up (or down) of an existing design.

Multiscale vasculatures occur naturally because they flow more easily than their counterparts with a few length scales. The future of evolutionary design everywhere points toward vascular, hierarchical flow architectures that will continue to morph with freedom and directionality.

Learn more:
https://www.interpore.org/awards/kimberly-clark-distinguished-lectureship-award-2023/

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BIO OF PROF. ADRIAN BEJAN

Adrian Bejan was awarded the 2018 Benjamin Franklin Medal for "his pioneering interdisciplinary contributions in thermodynamics…and constructal theory, which predicts natural design and its evolution in engineering, scientific, and social systems."

He earned all his degrees from the Massachusetts Institute of Technology: B.S. (1971, Honors Course), M.S. (1972, Honors Course) and Ph.D. (1975). He was Fellow of the Miller Institute for Basic Research in Science, University of California Berkeley (1976-1978). Since 1989 he is the J.A. Jones Distinguished Professor at Duke University.

Prof. Bejan's research is in applied physics, thermodynamics, theoretical biology, and design and evolution everywhere in nature, bio, and non-bio. He created original methods of theory, modeling, analysis, and design, which today are associated with his name: entropy generation minimization, scale analysis, intersection of asymptotes, heatlines, constructal law, and evolutionary design everywhere in nature, bio and non-bio.

He is the author of 30 books and 700 peer-refereed journal articles. Google Scholar: h = 106, total citations 83,000. According to the 2019 'citations impact' world rankings, he is 9th among all Engineering authors in the world, all disciplines.

He was awarded 18 honorary doctorates from universities in 11 countries, for example, Swiss Federal Institute of Technology (ETH Zurich), University of Rome I "La Sapienza", National Institute of Applied Sciences (INSA) Lyon, and University of Pretoria. He is a member of the Academies of Europe, Mexico, Turkey, Romania, and Moldova.

KIMBERLY-CLARK DISTINGUISHED LECTURESHIP AWARD

Among other awards, each year, InterPore will select a porous media researcher with a very high international recognition as the "InterPore Kimberly-Clark Distinguished Lecturer on Porous Media Science & Technology". The awardee will share a topic relevant to the industrial porous media community through a series of lectures at various member and non-member organizations.

A word of gratitude:

This award has been made possible by a generous grant from Kimberly-Clark, home to some of the world's most iconic and trusted brands, including: Huggies, Scott, Kleenex, Cottonelle and Kotex. For more than a century Kimberly-Clark has been transforming insights and technologies into innovative products and services that improve the lives of nearly a quarter of the world's population.

INTERPORE FOUNDATION

InterPore Foundation for Porous Media Science and Technology is a non-profit, non-governmental, independent organization. It was founded by the International Society for Porous Media in 2016.

Find out more about the foundation at:
https://www.interpore.org/interpore-foundation/

HOW TO APPLY

Are you interested in hosting Adrian Bejan at your institution? Please submit your application online. Non-members may also apply.

To request the presentation, please visit: https://www.interpore.org/awards/kimberly-clark-distinguished-lectureship/
download and fill out the application form and return it by e-mail.

For further questions please contact: *executive-officer@interpore.org*

Please be aware that the lecturer availability will be limited and not all requests can be honored by the lecturer.

LECTURE OPTIONS

Due to the COVID-19 pandemic's continual effect on international travel, Prof. Bejan will also be offering the option of online and hybrid lectures (some audience members attend in-person and others virtually) in addition to in-person appearances.

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