

PURDUE FLUIDS SEMINAR SERIES

The Life of a Vortex Ring

FRIDAY SEPTEMBER 6TH, 2024
SEMINAR 2:15PM-3:00PM ARMS 1010
DISCUSSION 3:30PM-4:00PM ARMS 1109



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Abstract:

Vortex rings abound in nature and technology. In this talk the many stages in the life of a vortex are investigated and described - initial formation, laminar motion, linear and nonlinear instabilities, turbulent motion and decay, and the final, asymptotic laminar motion. Insights into the fluid physics of each of the stages are revealed by the combined forces of theory, experiment, and numerical simulation.

Biography

Anthony Leonard is the Theodore von Kármán Professor of Aeronautics, Emeritus at the California Institute of Technology. He received a B.S. degree in Mechanical Engineering from Caltech in 1959 and a Ph.D. in Mechanical Engineering from Stanford in 1963 with a specialty in nuclear engineering. He had positions at the RAND and at NASA's Ames Research Center in the Computational Fluid Dynamics Branch. Dr. Leonard's academic career includes seven years at Stanford as Assistant and Associate Professor of Mechanical Engineering. For the past 39 years he has been at Caltech. He is a member of the US National Academy of Engineering, a Fellow of the American Physical Society, and a Life Member of Clare Hall, University of Cambridge. Professor Leonard's interests are in the area of computational fluid dynamics and its application to a wide variety of flows including turbulence, transitional flows, bluff-body aerodynamics, and flow-induced vibration. He has worked on developments in Lagrangian vortex methods, spectral methods, techniques for large-eddy simulation, and low-order modeling of vortex flows. He has also been involved in the application of dynamical systems theory to fluid transport and mixing.



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