UNIVERSITY OF MARYLAND

THE BURGERS PROGRAM FOR FLUID DYNAMICS
THE FLUID DYNAMICS REVIEWS SEMINAR SERIES

WHY WE DO NOT NEED DARK ENERGY OR DARK MATTER TO DESCRIBE OUR UNIVERSE

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DeWalt Seminar Room
2164 Glenn L. Martin Hall

Speaker

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ABSTRACT

The much publicized search for Dark Energy and Dark Matter has come about almost entirely because of the failure of classical solutions to Einstein's field equations to describe the observed expansion of the universe and the rotational motion of galaxies. Adding up to 95% dark energy and dark matter "fixes" the solutions, but provides no way to predict in advance how much is needed, nor its source.

This talk describes two new solutions using different starting assumptions and methodologies that have been very successful in turbulence. Both appear to be remarkably consistent with the astronomical data with no additional hypotheses, adjustable parameters, nor either dark matter or energy. Both solutions begin with the averaged Einstein field equations' -- in the case of universe expansion, averaged over galaxies, and in the case of galaxies, over the stars, gases and dust.

The expanding universe approach is very closely related to the problems of turbulence in an infinite domain, and the equations are closed using the hypothesis that length and time scales of an infinite universe evolve together. The solutions presented herein describe the entire universe from a few Planck times (5×10^{-44} sec.) to the present. The starting condition is the so-called "Worst Prediction in the History of Physics", which has been believed previously to have been in error by a factor of 10^{120}. The new results nicely describe the rotational velocities of many of the observations (e.g. galaxy M33) without a need for dark matter. And they suggests ways to expand the approach to all galactic motions.

BIO

Professor George is a Maryland native and maintains since 2011 a zero net energy retirement home in Cambridge, MD. He was a 1963 graduate of Cambridge Senior High, and received his B.E.S in Engineering Physics in 1967 from the Johns Hopkins University. He was a awarded a Ph.D. in Mechanics by JHU in 1971. He spent most of his early career at the State University of New York at Buffalo before moving to Sweden in 2000. With his 30 Ph.D. students and co-workers, he has published hundreds of papers, both theoretical and experimental, with over a million citations. He was a pioneer in the applications of lasers to flow measurement, and his experimental work is heavily cited for everything from the design of industrial sprinkler systems to reduced-noise jet nozzles and modern gas turbines. His translation of Wind Atlas for Denmark in 1981 into English was a major contributor to the rapid expansion of wind-power throughout the world. His notes on turbulence "Lectures in Turbulence for the 21st Century" (available on-line) have helped turbulence come alive for many around the world. His theoretical work on turbulence overturned decades of over-simplification. He was the first to recognize and provide theoretical foundations for the important role of initial conditions previously believed to not exist asymptotically. This presentation will apply some of the same principles to equations of general relatively as applied to universe expansion and galactic motions.

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