

CENTER FOR BEAM PHYSICS SEMINAR

“The NASA Breakthrough Propulsion Physics Project”

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Albert Ghiorso Conference Room, bldg. 71, LBNL

Summary: There comes a time to seek the next revolutions in technology. That time is when the performance of existing methods is approaching its theoretical limits and when clues are emerging for new methods that might surpass these limits. Such is the case with rocket propulsion and the emergence of scientific literature on wormholes, warp drives, superluminal quantum effects, quantum vacuum fluctuations, and various other effects. To determine if science has evolved sufficiently to begin a deliberate search for new propulsion physics, NASA created the “Breakthrough Propulsion Physics” (BPP) project in 1996. Specifically, the project has three grand challenges: (1) discover propulsion methods which eliminate or dramatically reduce the need for propellant; (2) discover methods for achieving the shortest possible travel times (includes the study of methods to circumvent observed limits); and (3) discover new modes of on-board energy generation to power the propulsion devices. Because these challenges are presumably far from fruition (and perhaps even impossible), a special emphasis is to identify incremental and affordable research that will address the critical issues and opportunities related to these challenges. The presentation will cover both the relevant physics and the methods being used by the BPP Project.

Biographical data and research interests: Marc Millis has been with NASA’s Glenn Research Center since 1982 after earning a degree in Physics from Georgia Tech. In addition to his more conventional engineering assignments that have included designing guidance displays for aircraft low-gravity trajectories, ion thrusters, monitoring systems for rocket engines, and cryogenic propellant delivery systems, he has researched possibilities for creating propulsion breakthroughs. As a part of this research, he forged collaborations with other researchers across the nation to create the NASA Breakthrough Propulsion Physics Project, of which he is now the Project Manager. He is also a graduate of the 1998 International Space University Summer Program. In his free time he builds, photographs and writes articles on scale models.

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