

Dr. Charles Bowman Bio
Accelerator-Driven Neutron Applications (ADNA) Corporation
GEM*STAR: The Alternative Reactor Technology Integrating Graphite, Molten Salt, and
Accelerators
Thursday, September 17, 2009
[Innsbrook Technical Center](#) - Richmond, VA

***"GEM*STAR: The Alternative Reactor Technology Integrating Graphite, Molten Salt, and
Accelerators"***

Charles Bowman received a Ph. D. in nuclear physics from Duke University in 1961 and a B.S. in physics from Virginia Tech in 1956. He is a fellow of the American Physical Society and the Los Alamos National Laboratory (LANL). He led neutron source developments and their science application at Lawrence Livermore National Laboratory, the National Institute of Standards and Technology, and LANL.

Dr. Bowman was the first construction project manager for the Manuel Lujan Neutron Scattering Center at Los Alamos, and assembled the Weapons Neutron Research group at the Los Alamos Neutron Science Center (LANSCE). He devised means to provide the proton beam concurrently to both facilities, enabling LANSCE to become the world's most versatile facility for neutron science. His last project at LANL was the origination and leadership of Accelerator Transmutation of (nuclear) Waste. He formed Accelerator-Driven Neutron Applications (ADNA) Corporation in 1997 to devote full attention to optimizing the benefits to nuclear energy generation of supplementing fission neutrons with neutrons from accelerators.

GEM*STAR (Green Energy Multiplier*Subcritical Technology for Alternative Reactors) is an accelerator-driven reactor operating with a continuous-flow molten-salt fuel in a graphite matrix devised as a practical and economic approach to the solution of most of the major problems of nuclear energy. It can use natural uranium fuel generating as much electric power as a Light Water Reactor (LWR) generates from the same mined uranium.

GEM*STAR also can burn unprocessed LWR spent fuel including uranium, fission products and all higher actinides, generating as much electricity from this waste as the LWR had generated. Therefore the spent fuel from today's LWR is provided a future that is alternative to long-term cask storage, reprocessing, or once-through geologic storage. GEM*STAR uses liquid fuel allowing recycling of its own output as later-pass fuel without any chemical processing operations. This repeated recycling allows transmutation of the long lived fission products and higher actinides, thereby delaying the need for geologic storage for centuries and reducing the ultimate waste to be stored by about a factor of 10. GEM*STAR lowers electricity cost in spite of the accelerator by achieving a higher thermal-to-electric efficiency and avoiding the technical and political problems of current nuclear-power technology arising from enrichment, reprocessing, fast reactor deployment, and near-term high-level waste storage.

Avoiding the need for enrichment and reprocessing is a major step toward divorcing nuclear energy from nuclear weapons technology. Without generating "Green House Gases" and by

keeping electricity costs competitive with today's coal, GEM*STAR will compete with and ultimately displace coal for baseline electricity generation.

TIMES:

- Social - 5:30 PM
- Dinner - 6:15 PM
- Talk - 7:00 PM

COST: \$30 (Students \$10), Open Bar