

TITLE: Keeping Gd-Loaded Water Crystal Clear... Indefinitely!

ABSTRACT: Loading a water Cherenkov detector with a water soluble gadolinium compound makes possible the detection of thermal neutrons, dramatically improving such an enhanced detector's sensitivity to anti-neutrinos fluxes from both nuclear reactors and supernova explosions. But how can the Gd-loaded water be continuously repurified, maintaining its excellent optical properties, without also removing the dissolved gadolinium? A new technology - the molecular band-pass filter - has recently been developed and is currently being industrialized. The zen and the art of Gd-loaded water - including some of the more entertaining bumps encountered along the way to a viable system - will be discussed by the inventor of this technology.

BIO: Prof. Mark Vagins received his B.S. from the California Institute of Technology and his Ph.D. in particle physics from Yale University. He is currently a professor at the University of Tokyo's Kavli Institute for the Physics and Mathematics of the Universe (with a joint appointment at the University of California, Irvine) and is one of the central participants in the Super-Kamiokande experiment in Japan. When not hunting supernova and reactor anti-neutrinos, he enjoys scuba diving, flying ultra-light aircraft, zip-lining through jungles, walking across active lava fields, eating raw pufferfish, loitering in high radiation areas, child rearing, public speaking, and other life-threatening activities.