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# Giant Nuclear Systems and the Decay of the Vacuum in Supercritical Field

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Giant nuclear systems of the form U+U, U+Cm, etc. can be formed with life-times from 10-19 sec. to 10-21 sec. These life-times depend on mass transfer and energy loss. In such systems the e+e- -vacuum is overcritical and spontanous decay sets in. Paul Kienle has contributed with pioneering experiments to understand and verify many of the effects connected with these fundamental processes.
The vacuum structure for nucleons is different. In this case exists an upper potential well (the shell model) and a very deep lower well emerging out of the negative energy continuum. The lower well contains thousands of bound states. Holes in this lower well are bound antinucleons. This gives the possibility to create antinuclei like 4He-bar or 12C-bar, etc. directly out of the vacuum. The recent discovery of 4He-bar gives first indications for support of these ideas.

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