# Theoretical Description of Superheavy Nuclei

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The stability of the heaviest and superheavy elements has been a long-standing fundamental question in nuclear science. Theoretically, the mere existence of the heaviest elements with Z>104 is entirely due to quantal shell effects. Recent years have brought significant progress in the production of the heaviest nuclei. During 1995-96, three new elements, Z=110, 111, and 112, were synthesized by means of both cold and hot fusion reactions. These heaviest isotopes decay predominantly by groups of alpha particles as expected theoretically. Recently, two stunning discoveries have been made. Firstly, hot fusion experiments performed in Dubna employing "hot fusion" reactions gave evidence for the synthesis of new isotopes of the element Z=114. Secondly, in the "cold fusion" experiment at Berkeley three alpha chains, attributed to the element Z=118, were observed. In this talk, the theory of the superheavy elements is reviewed with the main focus on nuclear structure aspects.

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