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Superheavy Elements: Status and Future

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In 1966 Myers and Swiatecki predicted a new, spherical closed shell, centered at an element with $Z=126$ and $A=310$. In this region, now referred to as the “Island of Stability,” shell-effects were predicted to stabilize these spherical “superheavy” elements (SHE) with $Z \approx 114-126$ against fission, leading to predicted half-lives of years or longer. In 2000, more than 30 years after these predictions were made, scientists at the Flerov Laboratory of Nuclear Reactions reported on the first successful experiments aimed at approaching this region of spherical superheavy elements. Since that time, six new elements and more than fifty new isotopes with $Z \geq 112$ have been discovered. More recently experiments have transitioned away from discovery and towards understanding production, chemistry and investigating the level structure of SHE. On the other side, theoreticians have been looking for reactions that may reach the Island of Stability. In this talk, an overview of SHE research will be presented, with a focus on recent results and new directions in the field.