

## Perspectives of Fundamental Actinide Science: Past, Present and Future

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The actinide series of elements started to be developed in the nineteen forties. A few years earlier the Periodic Table of elements was assumed to be complete at element 92. Today the actinide series is well established through element 103, and fundamental studies involving these elements remain active. The actinide series is considered a 5f-electron series, one of the two known f-electron series, and its members have complex and varying physicochemical natures. Unraveling their variable and often complex science has been and remains a challenge, which will become apparent during the different aspects discussed in this seminar. There are many facets of fundamental actinide science, most of which involve in some fashion the changing role of the 5f-electrons across the series. Many scientific opportunities exist regarding studies of these elements and their compounds. This presentation will address the general nature of these elements, the experimental techniques and the challenges encountered in performing research with them, and some of the goals being pursued at ORNL. With regard to the latter, an overview of important insights into actinide bonding gained from high-pressure, condensed-state studies will also be discussed.

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