

From Quasicrystal to Heavy Fermions and Back Again

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Our Ames Laboratory research effort has a long standing, broad interest in the interaction and competition between electronic, magnetic and structural degrees of freedom in metallic materials.[1-3] Part of this effort has been the study of 4f-shell bearing crystalline and quasicrystalline materials. In this lecture I want to illustrate the chain of ideas, discoveries, and technical advances that led us from the study of i-RMgZn quasicrystals [4-6] to the discovery of a 6-pack of new heavy fermions in the YbT₂Zn₂₀ materials [7] to the discovery of i-ScZn as a new binary quasicrystal [8] and finally the prediction and discovery of the i-RCd family of binary quasicrystals.[9] I hope that I can emphasize the importance of a flexible research agenda coupled with tolerant collaborators with well-developed senses of humor.

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