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Exploring Atomic Nuclei¹

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Atomic nuclei were discovered almost a century ago. Stable isotopes found on earth are now well-studied and sophisticated models and theories have been developed to reliably predict their properties. With accelerated heavy-ion beams in the 1960s and 1970s it became possible to extend our knowledge to unstable nuclei relatively close to stability. Starting in the late 1980s it became apparent that exotic nuclei far from stability could exhibit qualitatively different properties from well-bound nuclei. Now that it is established that descriptions which were appropriate for stable nuclei lose their predictive power for exotic nuclei, we are at the dawn of a new era of science with atomic nuclei: An era where we will be able to test our revised and progressing understanding of atomic nuclei against experiments performed with specifically chosen isotopes. Future discoveries and resulting insights are enabled by new, dedicated facilities around the world. This talk will review the worldwide opportunities in advancing our understanding of atomic nuclei in the next decade.

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