

## **Precision mass measurements of short-lived nuclei for nuclear structure studies**

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The Precision mass measurements provide some of the most sensitive tools to investigate nuclear structure phenomena. The TITAN Penning trap mass spectrometer facility<sup>1</sup> at ISAC, TRIUMF has a unique set-up, which enables experiments of some of the most important isotopes in current nuclear structure physics. Recent studies that were carried out were focused on neutron-halo nuclei<sup>2,3,4</sup>, evolution and disappearance of neutron shells, for example around Ca-52<sup>5</sup> and the Island of Inversion. The mass determinations were possible because of the excellent production capabilities of the ISAC radioactive beam facility, but also because of TITAN's ability to carry out the shortest-lived Penning trap mass measurements<sup>3</sup> (Li-11,  $t_{1/2}=8.6$  ms) and access to highly charged ions to boost the precision<sup>6</sup>. The talk will give an overview of the nuclear structure program at TITAN and the physics impact in particular with respect to modern nuclear theory.

[1] J. Dilling et al., *IJMS* **251**, 198 (2006).

[2] M. Brodeur et al., *Phys. Rev. Lett.* **108**, 052504(2012).

[3] M. Smith et al., *Phys. Rev. Lett.* **101**, 202501 (2008).

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[5] A. Gallant et al., *Phys. Rev. Lett.* **109**, 032506 (2012).

[6] S. Effenauer et al., *Phys. Rev. Lett.* **107**, 272501 (2011).