

# **Designing a Laser Ablation Ion Source**

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A laser (ablation) ion source was designed for use in a university ion beam facility with an objective of generating a consistent output of ions in an ultra-high vacuum environment. To accomplish this, the apparatus uses motors similarly to a 3D printer to allow a Nd:YAG laser to evenly ablate the entire surface of a sample target multiple times. This mechanism has two motors on two different axes: one that rotates the target and one that moves it in the vertical direction. Vacuum-rated materials are used in the design, including acetal plastic, aluminum 6061, and stainless steel 316L. The challenges encountered in designing the ion source, which include the efficient use of the available space, incorporating repurposed parts from an old cesium sputter source, and the provision and isolation of high voltage to the appropriate parts of the ion source will be discussed in this work.