Development and optimization of large-area thin film sputtering process: An integrated simulation-experiment paradigm

Patrick Morse
Vice President of Research and Development
Junora LTD

In this talk, I will provide an overview of products and services that have been developed at Junora LTD for the large area thin film coating industry. Then I will delve deeper into the development of plasma, ion, and sputtering sources for thin-film synthesis in laboratory and production environments. Towards this end, using data-driven analysis of process support data combined with finite element simulations and plasma physics fundamentals, I will describe advances in sputtering equipment and thin film process development. Further, using this enhanced understanding of large area sputtering processes, I will also discuss the development of advanced target materials using new additive manufacturing techniques to further optimize sputtering processes.

Biographical sketch:
Patrick Morse graduated from the University of Arizona’s College of Engineering with a Bachelors in Mechanical Engineering in 2005. Starting at General Plasma Inc in 2004 as an Research and Development intern, after graduation Patrick worked full time as a Process and Development Engineer from 2005 to 2011. At General Plasma Inc., Patrick managed a R&D laboratory and developed a variety of sputtering, plasma, and ion sources for large area thin film applications. In 2011 Patrick became the Research and Development Manager for Sputtering Components Inc., and worked there until 2018. At Sputtering Components Inc., Patrick was responsible for developing a remotely controllable magnet bar, new magnetic
designs for rotary cathode sputtering, and a new large area PECVD source. In addition to developing new products Patrick was responsible for determining equipment and operating conditions for customer’s large area sputtering applications and troubleshooting of process issues after implementation. In 2018 Patrick became the Vice President of Research and Development for Junora LTD a position he currently holds. At Junora Patrick is responsible for developing new additive manufacturing processes to make high purity rotary target materials for large area sputtering applications.