

## Proposal for a EPS-TIG Satellite Workshop in conjunction to the “HiPIMS Today 2022” Conference

**Topic:** Current challenges in ionized thin film deposition

**Preliminary date:** February 1, 2022

**Target audience:** Aimed at early-stage researchers, supported by a few senior researchers to share experience.

**Participation:** By invitation only, selected by the organizers. An effort will be made to obtain gender balance. We would also like to include industrial R&D representatives.

**Size:** 15-20 participants (including 5-6 senior researchers)

We will identify 1-3 topics beforehand, which are found to be of particular interest for the thin film community involved in high-power impulse magnetron sputtering (HiPIMS). The participants will contribute to the selection of topics and will be notified beforehand so that they have a chance to prepare.

An effort will be made to obtain participation and collaboration from other EPS Divisions and Groups.

Each topic will be introduced by a short oral presentation followed by open discussions on how to best approach and tackle identified challenges. This will also serve as a networking environment to establish new collaborations working on these subjects. To this purpose the organizers will make sure that participants involved in 1) plasma process development, 2) plasma diagnostics, 3) plasma modeling, and 4) thin film characterization will be represented. The idea behind this approach is to encompass both experimental as well as theoretical skills in order to better tackle identified tasks within this rather complex field of process plasma physics, which also includes plasma-surface interaction leading to thin film formation.

Possible topics include:

**Optimization of HiPIMS discharges.** In HiPIMS operation, there are basically two goals: a high ionized flux fraction of the sputtered target material and a high deposition rate. We would like to address how to optimize these parameters by the selection of process parameters, such as pulse power, pulse length, gas pressure, and magnetic field strength.

**Industrial HiPIMS.** HiPIMS has successfully transitioned from R&D into a significant number of commercial applications and products. As in conventional sputtering most of the processes involve a reactive component from the gas phase, i.e. reactive sputtering. We would like to address if/when advanced feedback control is needed to avoid issues such as process instability and process hysteresis. This will also include discussions on suitable control methods.