



## Characterization of Thin Film Systems for Flexible Applications

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**Date:** March 2, 2021

**Time:** 1:00 p.m. – 5:00 p.m. (EST)

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### Webinar Description

Flexible electronics are becoming more available with applications ranging from foldable displays, wearable sensors, and packaging. However, these devices are mostly found in the research sector due to reliability issues that have yet to be resolved. The general build-up of flexible devices includes a polymer substrate with various thin films of metals and ceramics with specific mechanical and electrical functions. The lifetime of a flexible system is dependent on how the device is fabricated, the thin film architecture, interface strength, and the combined electro-mechanical behavior. To assess the electro-mechanical behavior several in-situ methods have been developed, mostly based on tensile straining and bending, which can be combined with electrical resistance measurements. In this webinar, fabrication of thin films on polymer substrates, the theories of electro-mechanical testing, various in-situ methods to characterize electro-mechanical behavior, and how material engineering can be used to design long-lasting flexible systems will be presented. Both monotonic and cyclic testing methods will be discussed and an outlook on the field will be provided. This webinar is aimed at being a practical guide to help one understand the basics of thin film deposition onto polymers, electro-mechanical testing methods, and the strengths and weaknesses of flexible thin film systems.

### Webinar Objectives

- Thin film deposition techniques for polymer substrates
- Theories behind fragmentation testing/tensile straining of thin films on compliant substrates
- Constant volume approximation for electrical resistance measurements
- Monotonic and cyclic tensile straining methods: in-situ and ex-situ
- Cyclic bending methods: in-situ and ex-situ
- Interface characterization
- Known material influences: thickness, architecture, residual stress, substrates
- Failure criteria and outlook on the field

### Who Should Attend

This webinar is intended for researchers, students, technologists and others involved in research with flexible thin film systems who are looking to gain an understanding or broaden their knowledge on deposition methods and electro-mechanical characterization techniques. The course will be beneficial to a large audience, from young scientists to engineers, as various aspects from thin film fabrication, theories, instrumentation, and materials science-based design guidelines will be discussed in the context of creating long-lasting flexible electronic devices.