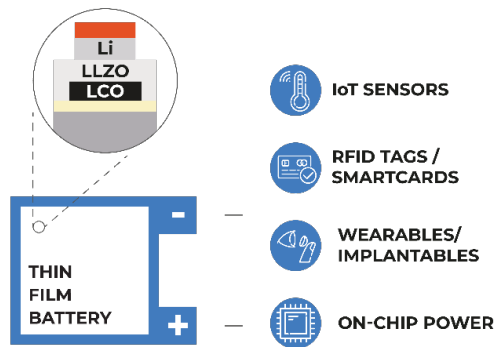


## Master's thesis:

# Rechargeable Solid-State Batteries

at the Laboratory for Thin Films and Photovoltaics, Empa (Dübendorf, Switzerland)

The Laboratory for Thin Films and Photovoltaics is internationally known for innovative research in the field of thin-films for photovoltaic and battery applications. Solid-state thin-film batteries are one of the research topics within our group, utilizing the advantages of thin-film manufacturing processes for solid-state batteries. These thin-film batteries, sometimes referred to as micro-batteries, are designed to power devices such as wireless sensors and consumer electronics and serve as a model system for safe, high energy density rechargeable batteries.



This project aims to investigate new materials for the development of next-generation rechargeable batteries. You will learn how to fabricate thin films using a variety of state-of-the-art techniques like sputtering, thermal evaporation, and solution-processing. Using these methods, you will fabricate cathodes for solid-state batteries, with the possibility to manufacture a full rechargeable solid-state battery. You will further learn the characterisation techniques required to study morphology and electronic and ionic properties of these materials. In particular, you will investigate the behaviour of the ionic and electronic conductivity of cathodes under various influences such as temperature, state of charge, and illumination.

This project requires multidisciplinary knowledge. Therefore you are welcome to apply if you have a background in physics, chemistry, materials science, or electrical engineering. It is possible to tailor the project to the subject area and your specific interests. Feel free to contact us for further information.

**Duration:** 6 to 12 months

**Starting date:** Anytime

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**Website:** <https://www.empa.ch/web/s207/thin-film-batteries>