

## VIRTUAL SEMINAR

Thursday, 27.5.2021 at 13:00

### MPŠ Seminar 3

## Twin-assisted microstructure development in Ta<sub>2</sub>O<sub>5</sub>-doped SnO<sub>2</sub>-CoO ceramics for low-voltage varistor applications

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Tin dioxide (SnO<sub>2</sub>) is a wide band gap n-type semiconductor with a tetragonal rutile-type structure and an advantageous combination of chemical, electric and optical properties that makes it favorable in many applications, including varistors. It is rarely used in its pure form since it exhibits poor sinterability and rather high electrical resistivity. Densification and electrical conductivity of SnO<sub>2</sub> can be greatly enhanced by adding a balanced addition of acceptor and donor dopants. Doping tin oxide with pentavalent oxides, such as Nb<sub>2</sub>O<sub>5</sub> and Ta<sub>2</sub>O<sub>5</sub> trigger abundant twinning, which has not been studied yet in SnO<sub>2</sub>.

In the Seminar I will focus on the processing of low-voltage SnO<sub>2</sub>-based varistor ceramics with the emphasis on studying the influence of twin-forming dopant Ta<sub>2</sub>O<sub>5</sub> on grain growth, microstructure development and related electrical properties. Based on targeted sample preparation and electron microscopy studies of SnO<sub>2</sub>-CoO-Ta<sub>2</sub>O<sub>5</sub> system I propose a charge compensation mechanism that describes solid-state reactions in this system.

Kindly invited.