

## **Impedance studies of interfacial phenomena in perovskite solar cells**

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Recent reports in the literature have shed light on the key role of device interfaces in perovskite photovoltaics. Impedance spectroscopy is a non-invasive technique which is powerful for investigating electrical and ionic transport phenomena in energy devices. In this talk I will briefly review the theoretical background of impedance spectroscopy, how to interpret impedance spectra, and discuss results from the literature on impedance studies on perovskite devices. I will then present our recent results on solar cells consisting of double and triple cation perovskites interfaced with ZnO nanorod arrays. We observe that passivating the ZnO surface with Au nanoparticles improves the fill factor and open circuit voltages of the devices. By combining X-ray diffraction, optical spectroscopy and impedance spectroscopy, we attribute the increase in device performance to improved charge transfer between the ZnO transport layer and perovskite.