



## SCDT – FlexE Centre Webinar Series

*The webinars aim to bring together researchers in Flexible Electronics and allied areas from across India (and other countries) on a single platform to promote professional interaction.*

### Webinar by



#### **Dr. Hasitha Weerasinghe**

Flexible Electronics Laboratory,  
CSIRO Manufacturing,  
Clayton, VIC 3168, Australia

on

#### **“Towards Highly Efficient Roll-to-Roll Printed Perovskite Modules”**

**Date:** 13<sup>th</sup> September, 2022

**Time:** 7:30 PM to 8:30 PM

Visit [www.iitk.ac.in/scdt/webinars.html](http://www.iitk.ac.in/scdt/webinars.html)  
to access the zoom link to join the  
webinar.

The event will be chaired by

**Dr. Mukesh Kumar**

Indian Institute of Technology Ropar

### **Abstract of the Webinar**

Roll-to-roll (R2R) printability combined with high ‘Power Conversion Efficiency’ (PCE) and proven long-term stability will make metal halide Perovskite-based Solar Films (PSFs) the most promising solar technology to address the global energy demand which is set to skyrocket over the next two decades.

In this presentation, typical roll-to-roll printing processes as well as CSIRO’s activities so far on R2R production of PSFs towards the large-area modules will be introduced and requirements of materials/processes to be used in roll-to-roll production will be addressed. We have developed new printing/coating methods as well as modified the existing printing methods to successfully print/coat the perovskite absorber layer along with the other critical layers R2R on flexible substrates. Range of device structures, perovskite formulations, and Electron Transport layer (ETL) and Hole Transport Layer (HTL) materials have been investigated using these printing/coating techniques. Finally, using R2R coating/printing techniques under ambient conditions. Steady progress of this project is highlighted by the demonstration of power conversion efficiency (PCE) values over 16 % for the flexible small-area PSF devices and PCE over 11% for the large-area PSF modules consist of R2R printed layers including the top metal electrode.

The results gathered so far show highly promising and valid upscaling path toward industrially viable, fully printable, large-area PSF-based modules showing higher PCE values and longer lifetime.

### **Information about the speaker**

Dr Hasitha Weerasinghe is a research scientist at the Commonwealth Scientific and Industrial Research Organisation (CSIRO) in Melbourne, Australia. After receiving his Bachelor’s (2002) and Master’s (2006) degrees in Physics, Dr. Weerasinghe completed his PhD degree at the Department of Materials Engineering of Monash University in 2011. He then held a post-doctoral research position at the University of Melbourne for two years and he was also a recipient of an ARENA Postdoctoral Fellowship. His research interests focus on fabrication and characterisation of perovskite/organic-based photovoltaic devices/modules, development of barrier encapsulation, new materials on improving stability and conducting lifetime studies of photovoltaic devices.