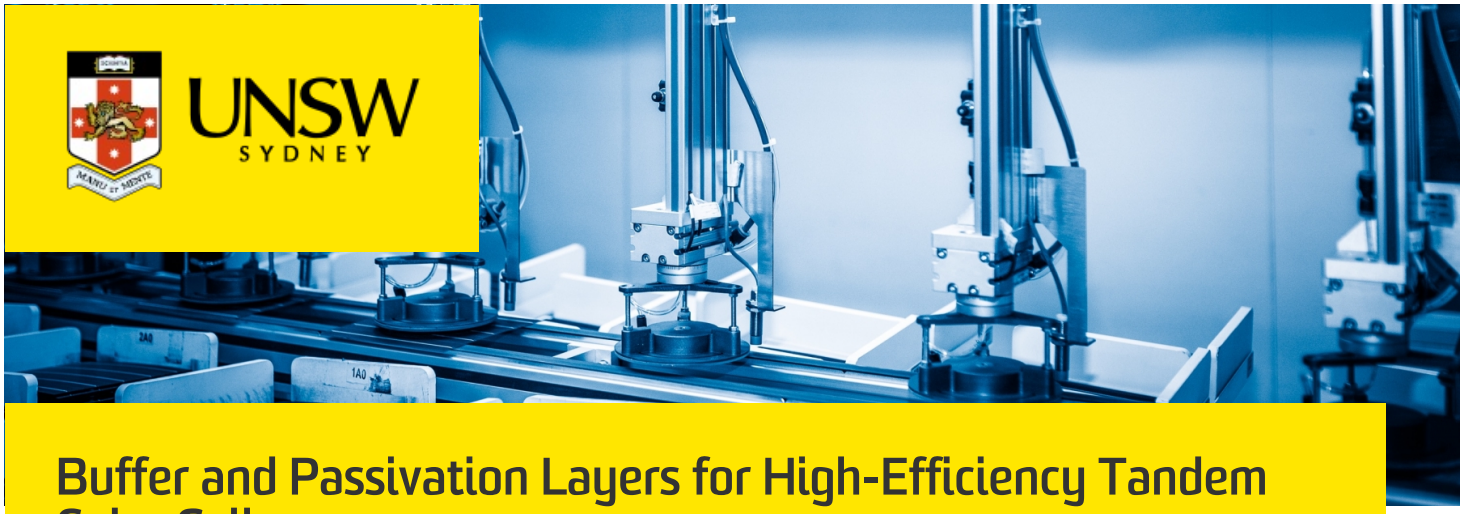

# Buffer and Passivation Layers for High-Efficiency Tandem Solar Cells

**It is quite well accepted that tandem solar cells are the most promising way to achieve a solar cell efficiency in excess of 30%. If these are to be silicon based, they will require both buffer and surface passivation layers in order to maximise their performance.**

## Competitive advantage

- The only laboratory in Australia that has an atomic layer deposition reactor with real-time feedback on the synthesised material, offering unprecedented advantages in terms of process optimisation and device integration
- Use of an advanced, computational material science approach to identify the most promising materials before synthesising them
- Ability to perform atomic-scale engineering using atomic layer deposition
- Real-time insight and control of thin film growth and its correlation to final device performance

## More Information

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## Impact

- The application of a buffer and passivation layer has already resulted in creating world-record efficiency in Cd-free CZTS solar cells.

## Successful outcomes

- A wide range of binary and tertiary compound thin films have been developed for integration into thin film solar cells

## Capabilities and facilities

- Both laboratory-scale and pilot-scale atomic layer deposition reactors to explore novel process from low- to high-technology readiness level
- Access to both lab-scale as well a pilot-scale thin film deposition equipment for swift transfer from the laboratory to the factory

## Our partners

- Working together with various leading worldwide research groups to test thin films at the solar cell device level