



**UNSW**  
SYDNEY



## High Rate Lithium Ion Energy Storage

**Lithium ion batteries that can be charged and discharged at high rates can play a critical role in stabilising electricity grids with a high proportion of renewable energy generators. These devices blur the distinction between supercapacitors and batteries, and may also find applications in electrical power buffering for mass transport systems.**

### Competitive advantage

- Expertise in fabrication of binder-free 3D electrodes for high rate electrodes and amorphous metal oxide electroactive materials
- New electrochemical modelling methods that can be used to distinguish between double layer storage and Faradaic charge storage
- Integrated experimental-modelling approach

### Impact

- High rate electrochemical storage will be critical for electrical grid stabilisation
- Potentially lower cost alternative to electrochemical capacitors in mass transport applications

### Successful applications

- 3D porous electrodes using metal foams and 3D printed current collectors
- Anodic titanium oxides binder-free electrodes for high-rate anodes

### Capabilities and facilities

- State-of-the-art electrochemical fabrication and characterisation facilities
- Expertise and access to PFG NMR and solid state NMR facilities
- Expertise in atomic scale modelling of electrode materials and electrochemical processes

### More Information

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