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THE MISSING LINK TO GREEN ENERGY – ENERGY STORAGE

A. Nurpeissova

Problems of humanity in the XXI century

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The need for energy storage

"What's the key to using alternative energy, like solar and wind? Storage - so we can have power on tap even when the sun's not out and the wind's not blowing"
Donald Sadoway

Li-ion batteries vs. other batteries

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Lithium-ion batteries have higher capacity and the ability to deliver more power

Lead acid:
Used in car batteries and inexpensive

Nickel cadmium:
Toys, power tools, older technology

Nickel-metal hydride:
Used in car first hybrid cars like Prius

Lithium-ion:
Best energy density, dropped in cost 50% since 2008

PERFORMANCE

Li-ion battery safety issues

Accomplished projects

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Li-ion sulfur battery

- No Li metal
- Abundant and low cost material
- High energy density
- High performance

Aqueous rechargeable lithium-ion battery

- High power density
- Environmentally friendly
- Low cost
- High performance

Current projects

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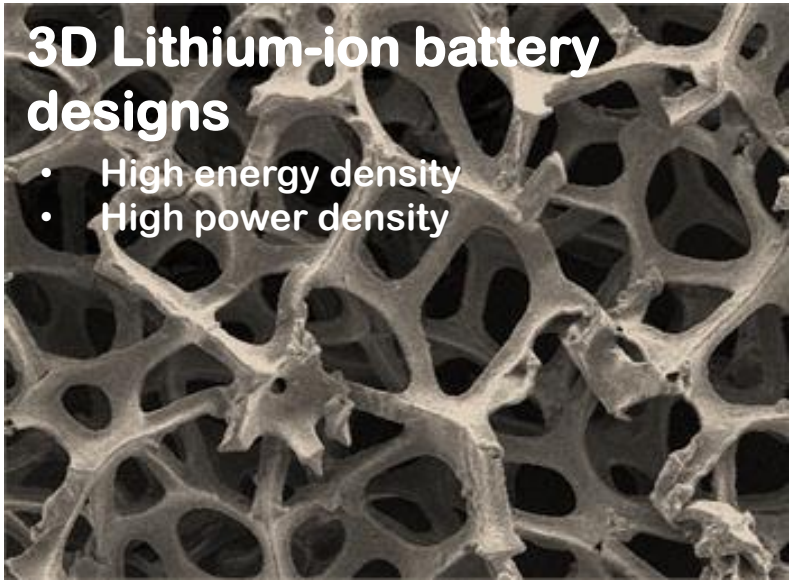
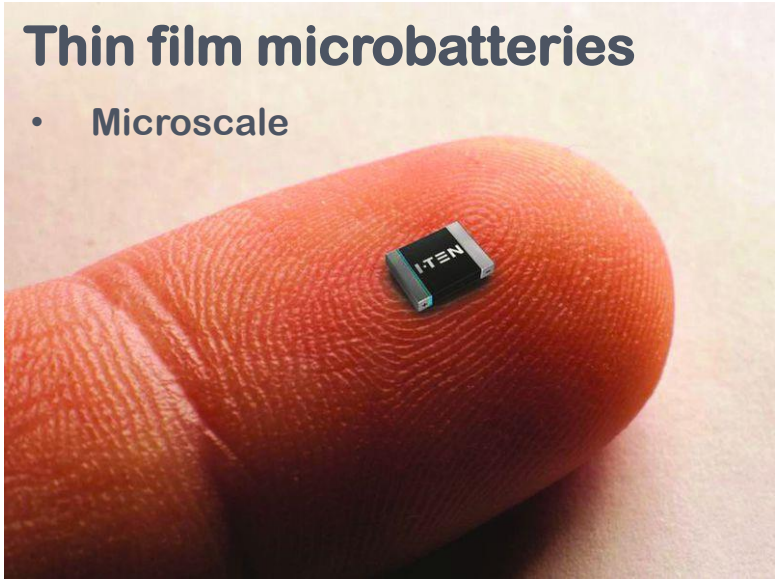
3D Lithium-ion battery designs

- High energy density
- High power density



Thin film microbatteries

- Microscale



Thank you for your attention!