IONIC DEVICES

We are a solid-state battery start up company out of the University of Maryland

Our Team

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UMD
Founder, CEO

Joel Polanco
Intel
Board Member, Business Advisor

Dr. Nam Kim
UMD
Founder
Semiconductor Processing

Prof. Gary Rubloff
UMD
Founder
Materials Science & Engineering

Prof. Sang Bok Lee
UMD
Founder
Chemistry

Our History of Innovation

2009-2014
Built first full battery in a nanopore

DOE EFRC
14 $M/5 years

2018
Proof-of-concept SSB

DOE EFRC
11.2 $M/4 years

2019-2020
SSB in Porous anodic aluminum oxide

EFRC Wind Down
2 $M/year

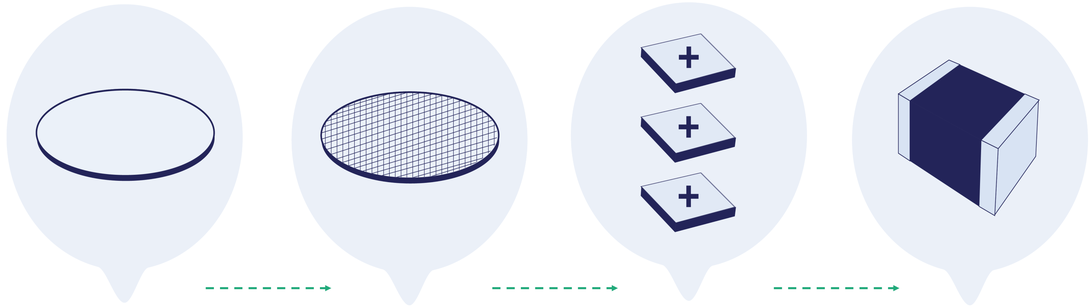
2020-2023
SSB in AAO

DOE Platforms
2.25 $M/3 years

Our Mission: Revolutionize Battery Manufacturing

State-of-the-art lithium ion batteries are made with dated manufacturing techniques from the industrial revolution. These techniques cannot be scaled down to microbattery scales. We have pioneered **three-dimensional thin-film fabrication of all-solid-state batteries using the portfolio of techniques which has underpinned the semiconductor electronics** industry for decades.

A Paradigm Shift to Semiconductor Based Manufacturing



Highly Porous Wafers

- Like silicon, they come in different diameters and thickness.
- Commercially available.

Pattern & Process

- Photolithography is used to define batteries.
- Well established vapor phase methods to deposit the battery layers.

Dies are Created

- Each wafer is chopped up into dies.
- Each die is a battery.
- Stacked to increase energy and tune voltage.

Packaged

- Leverage capacitor packaging.
- Form factor is flexible.
- Tunable voltage.

Safe Superior Performance

Superior Performance

- High energy density **>800 µWh/mm^3**.
- High power at no loss to energy.
- Tunable cell voltage.

Lower Cost

- **Financial**-cheaper and faster to produce.
- **Environmental** – Half the amount of CO_2, no cobalt

Stability of Operation

- Large temperature operation range
- No pyrophoric and toxic liquid electrolytes
- No explosive failure, no fires

Flexible Form Factor

- No external pressure.
- Complicated shapes