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## Background

### Intel:

- Memory and IO Technologies
- Product Development
- Sustainability/Corporate Responsibility
- Process Engineering

### Research/Academia

- Materials Research Society, Vice President
- Adjunct Professor, Materials Science and Engineering, Northwestern University

# Perspectives on Convergent Manufacturing

## Heterogeneous Materials Interfaces

- Micro Scale: Semiconductor Manufacturing
  - Scaling leads to interfaces dominating properties
  - Cluster tool development – disparate materials via in situ processing
- Mid Scale: Hybrid Bonding
  - Enables miniaturization, improves device performance
  - Integration of disparate silicon types
- Macro Scale: Focus “in field”
  - Product Adaptability / repurposing
  - In field repair