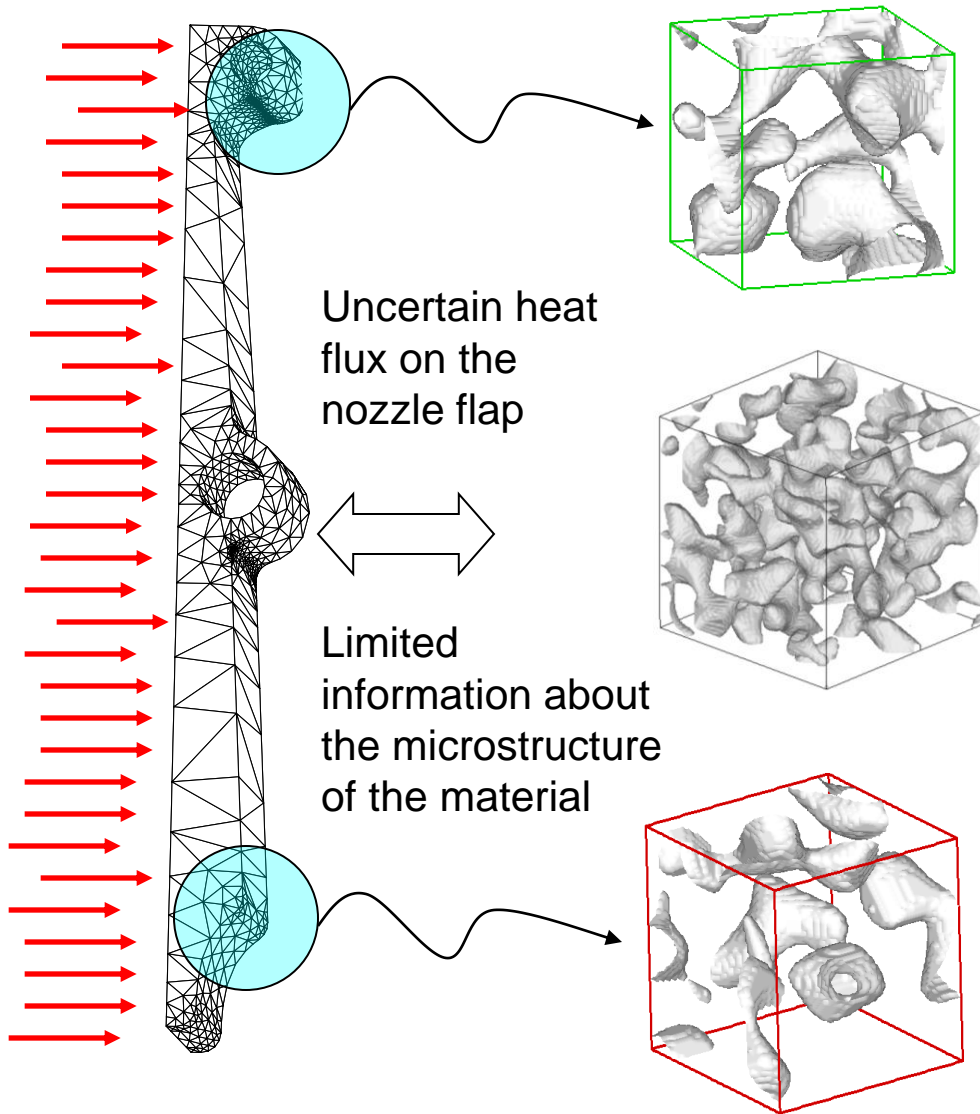


# UQ Across Length Scales



- Uncertainty in initial and/or boundary (operating) conditions at the macro scale +

Topological uncertainty at lower scales

*How do mechanical properties and damage evolve?*

*Will the device fail? With what probability?*

- Simple one way coupling: Upscale the property statistics to the macro scale and use to compute statistics
- Two way coupling: For tightly coupled problems, solve micro-macro stochastic PDEs simultaneously. **Need information theoretic models to propagate uncertainty across scales**