



UNIVERSITY OF  
LIVERPOOL

**MAINTAIN: Multi-Scale INTEGRITY for Advanced high-temperature Nuclear systems**



The University of Manchester



UK Atomic  
Energy  
Authority



OAK RIDGE  
National Laboratory

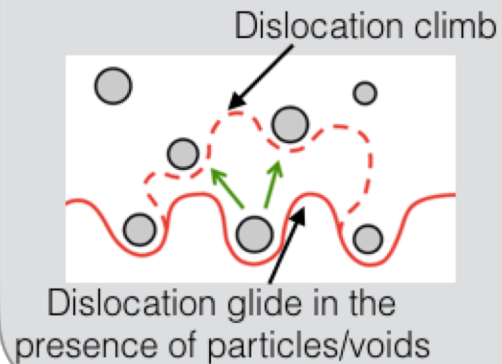
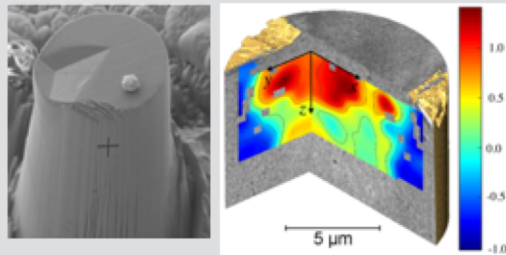
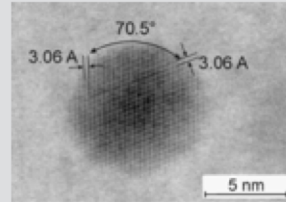
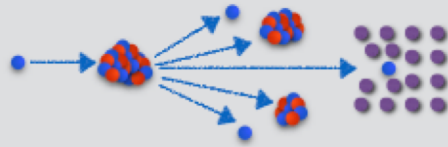
# Investigators

- **Bristol** - Mahmoud Mostafavi (PI), Peter Flewitt, Chris Truman
- **Oxford** - Ed Tarleton, James Marrow, Dave Armstrong, Alan Cocks
- **Manchester** - Joao Quinta da Fonseca
- **Liverpool** - Karl Whittle, Eann Patterson (Phil Edmondson - ORNL)

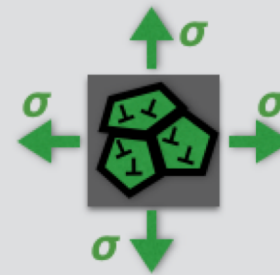
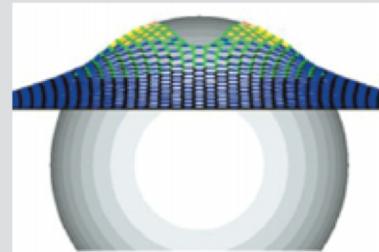
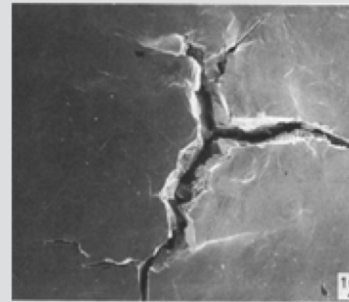
## Aims

- Include the effects of radiation damage into SI creep codes
  - Current and future material options
- How it impacts long term behaviour
  - Comparison between ions and neutron irradiated
- Validated Multiscale Modelling
  - Incorporation into codes such as R5

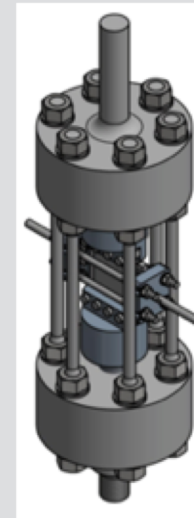
## WP1: Nano to Micro



## WP2: Micro to Meso

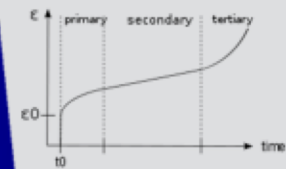
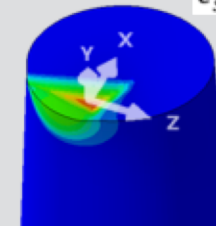


## WP3: Meso to Macro



$$\epsilon_{primary}^c = A_p \sigma^{n_p} t^{m_p}$$

$$\epsilon_{secondary}^c = A_s \sigma^{n_s} t$$

Volume  
( $\mu\text{m}^3$ ) $10^3$  $10^9$  $10^{14}$  $10^{20}$