



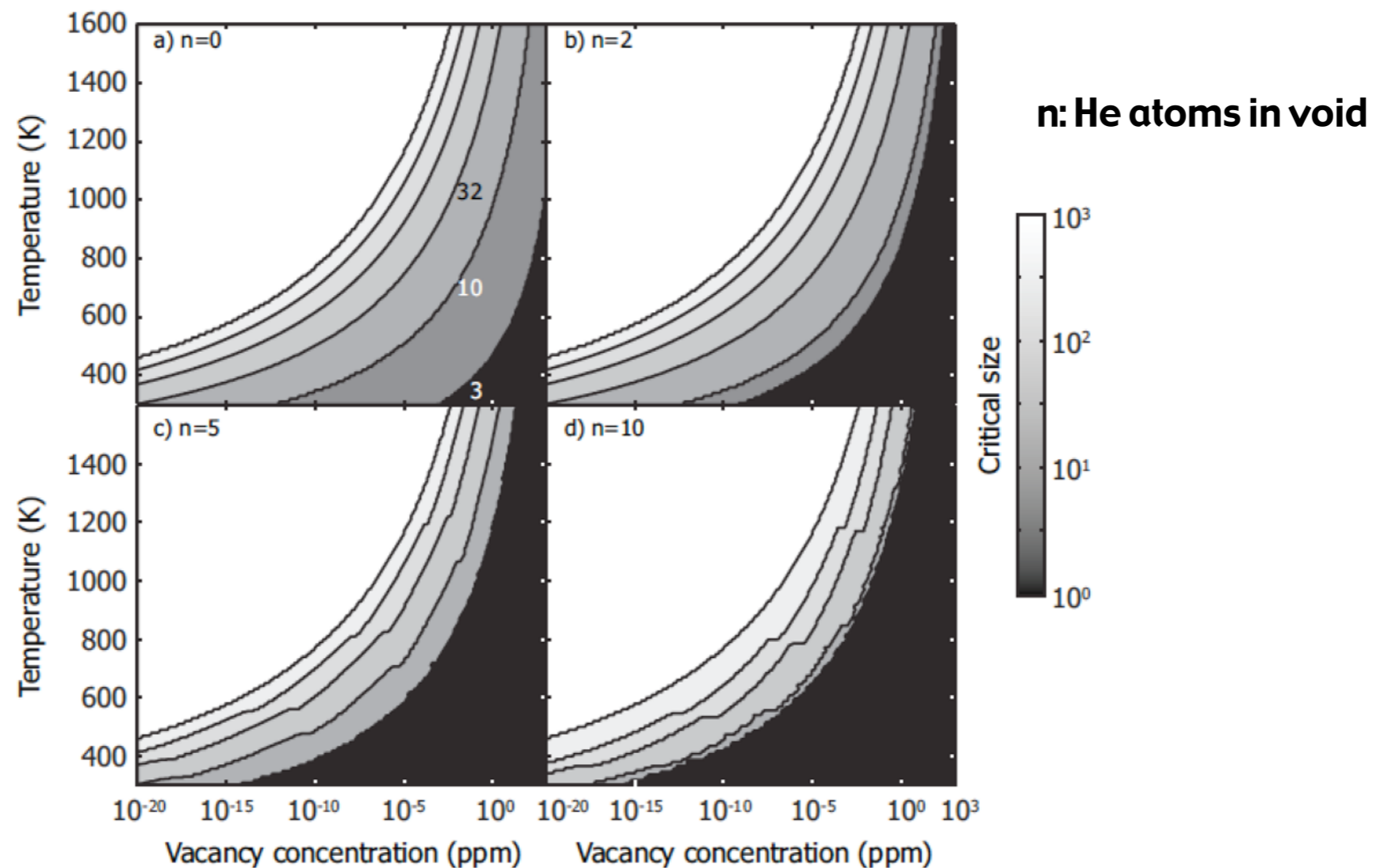
Modelling of He migration in inert matrices (KTH).



- **PhD thesis of Odd Runevall presented on April 4, 2012**
- *Helium Cluster Dissolution in Molybdenum, J. Phys. Condens. Matter 21 (2009) 335401*
- *Self-Diffusion in MgO, a Density Functional Study, J. Phys. Condens. Matter 23 (2011) 345402*
- *Helium Induced Void and Bubble Formation in MgO, Comp. Matter. Sci. 60 (2012) 53.*
- *The Impact of Helium on Void Nucleation in Molybdenum, J. Nucl. Mater., submitted*

- **Rate theory used to derive a Focker–Planck equation which calculates the critical size for voids in MgO and Mo to become stable in the presence of He.**
- **In Mo: very low He concentration is sufficient to stabilize small bubbles. Larger bubbles remain unstable with respect to He emission.**
- **In MgO: much higher He concentration is required to stabilize bubbles.**

Critical size of vacancy cluster to becomes stable as function of temperature, vacancy concentration and helium presence





Multi-scale modelling of fission gas migration in oxides (Imperial)



- **An empirical potential for UO_2 was delivered**
- **Reproduces bulk properties**
- **No model for gas migration delivered**