

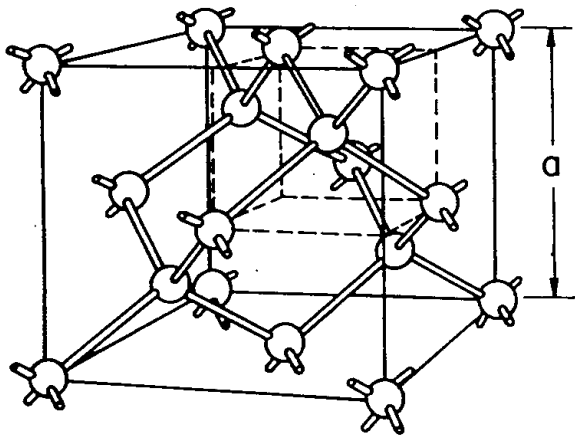
# Silicon and Silicon Detectors



**Universität  
Zürich**<sup>UZH</sup>

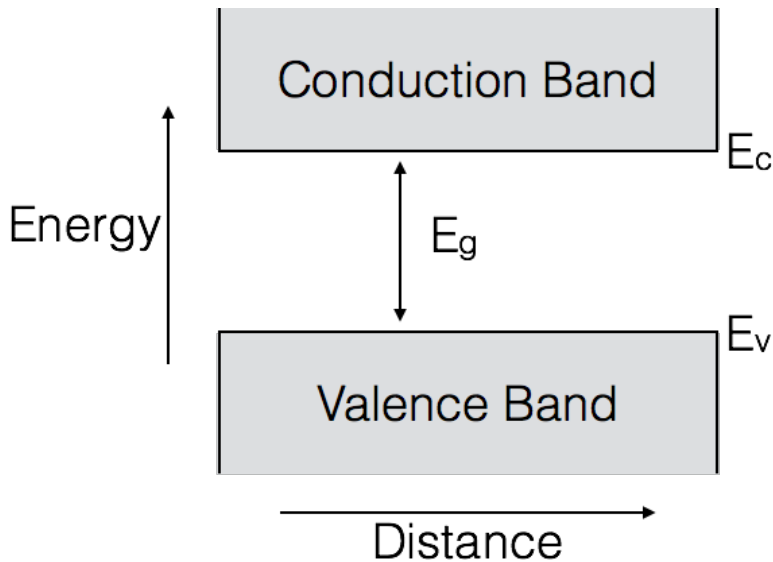
C. Betancourt  
Universität Zürich  
30.05.2018

## Diamond Lattice Structure

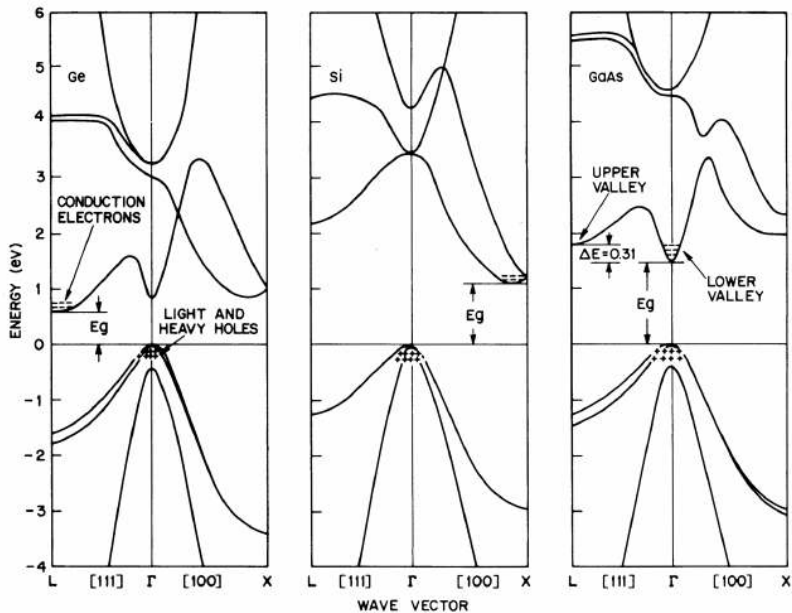


DIAMOND  
(C, Ge, Si, etc) .

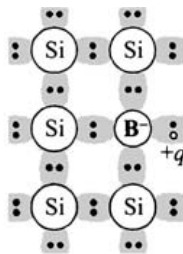
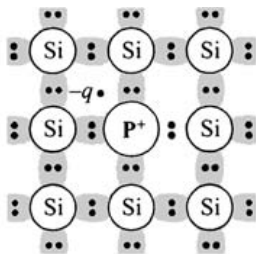
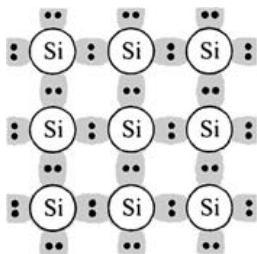
## Band Diagram

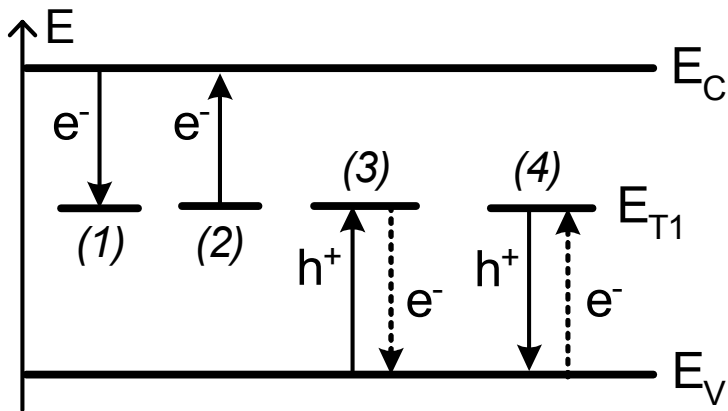


# Direct vs. Indirect Semiconductor

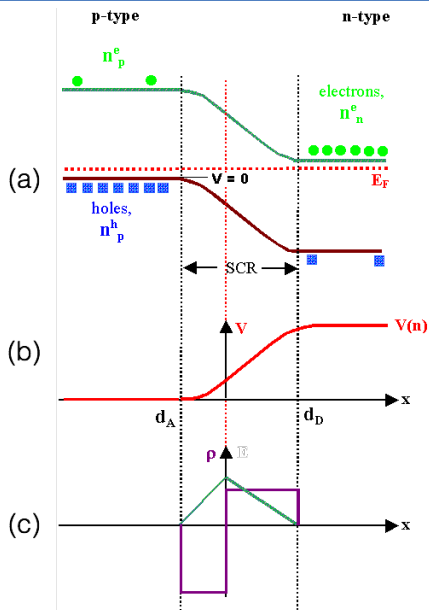


# Covalent Bonds and Doping

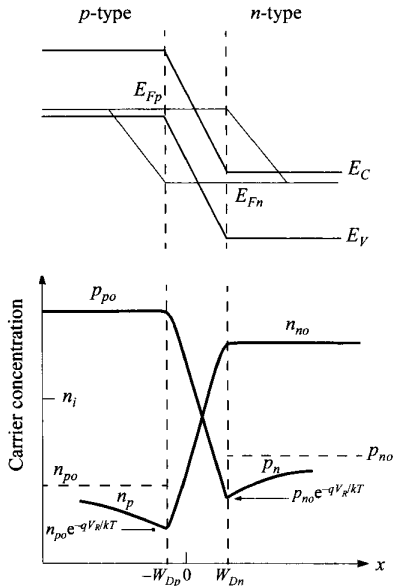
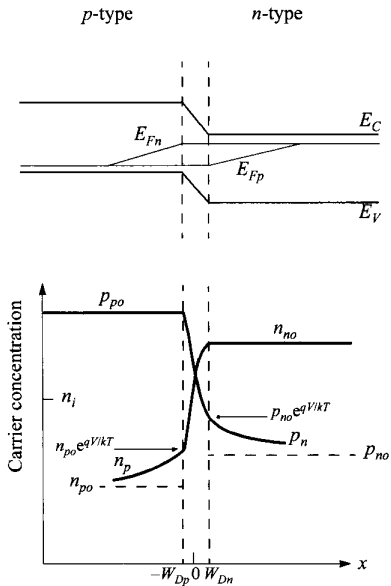




# The P-N junction

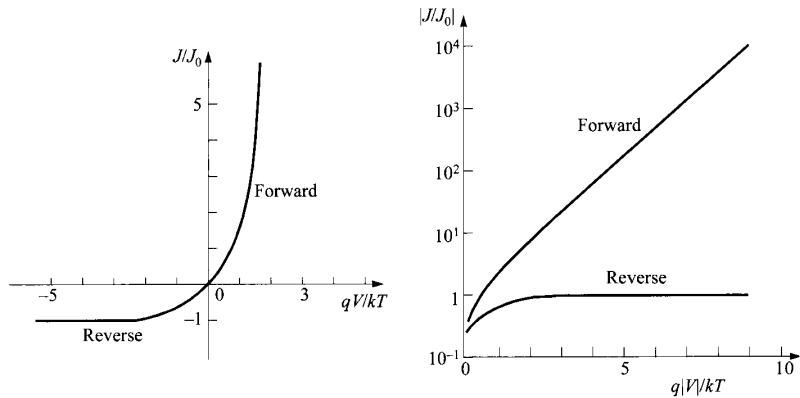


# Carrier transport

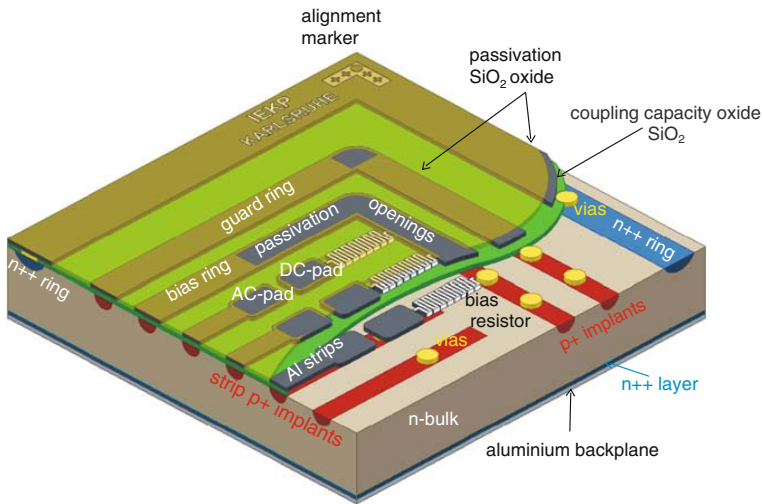




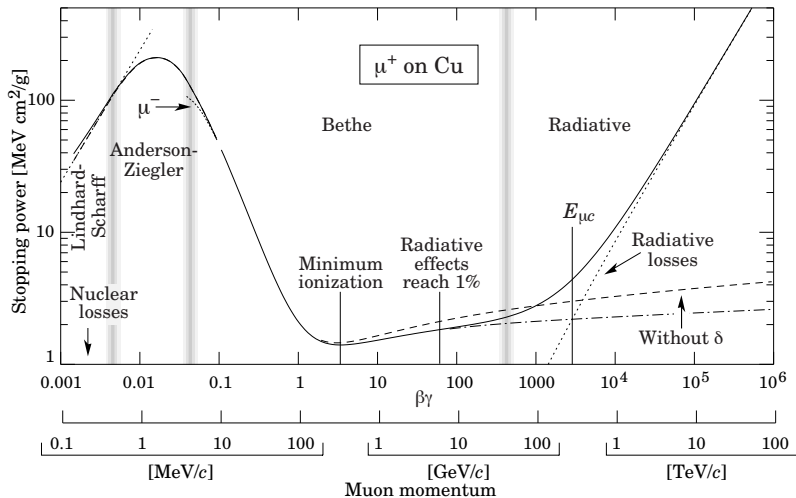
# Current-Voltage

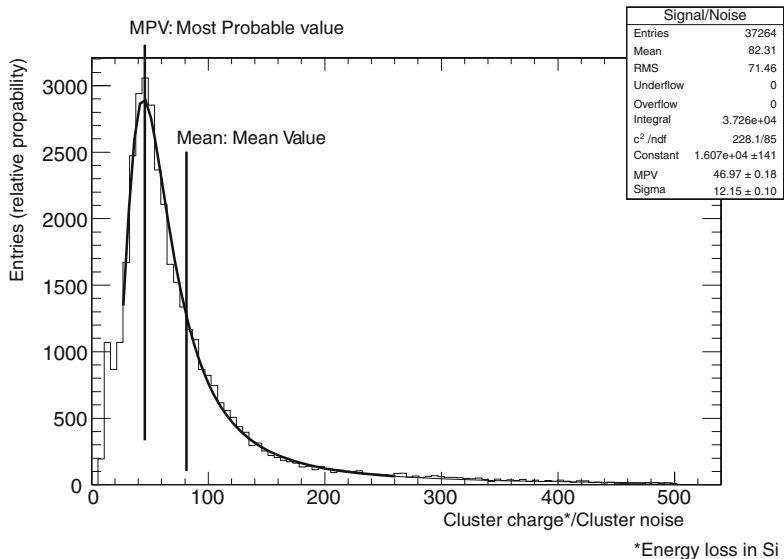


# Silicon Detectors

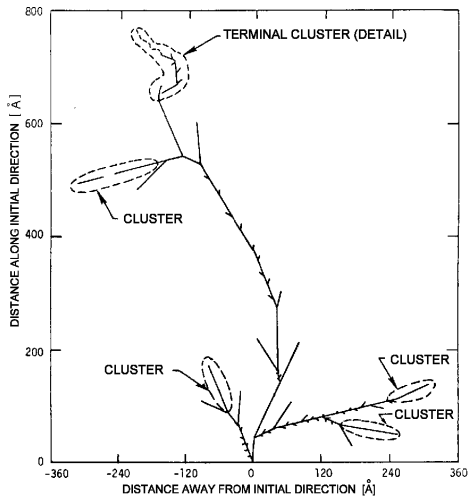
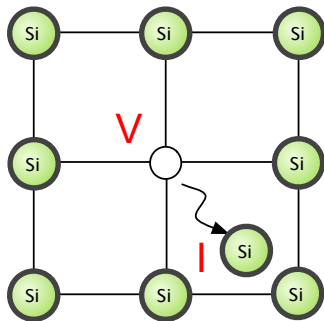


# Signal Formation

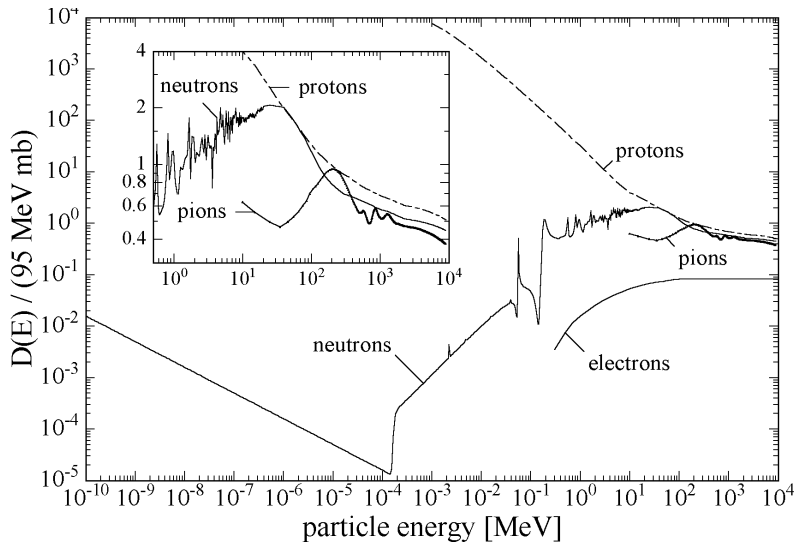




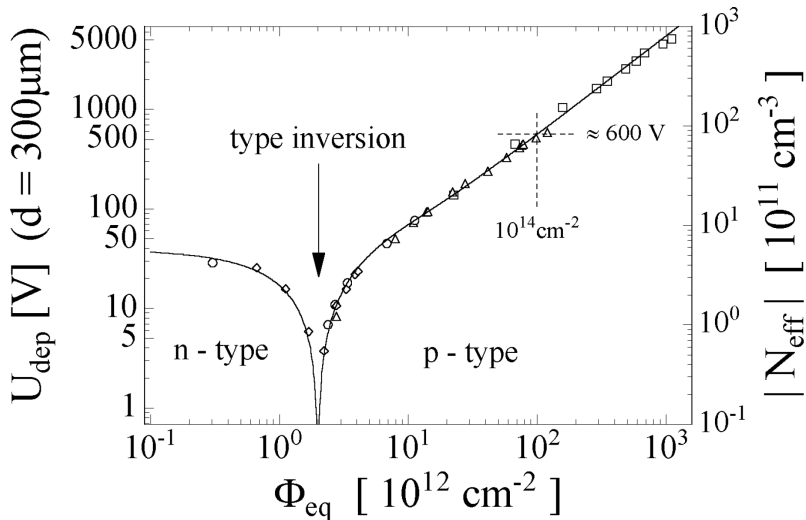
# Radiation Damage



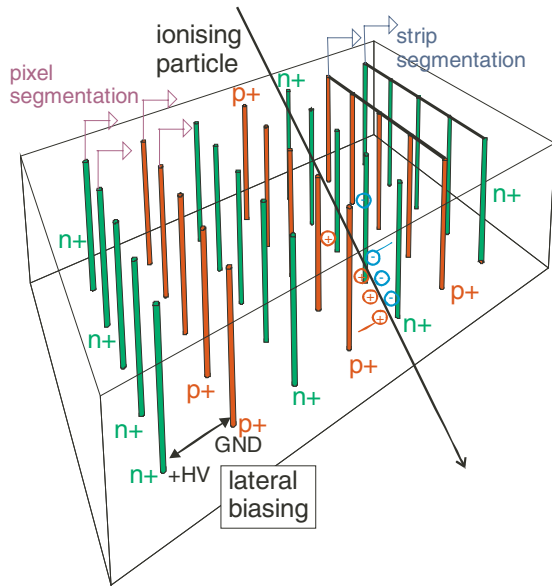
# Damage Factor: NIEL



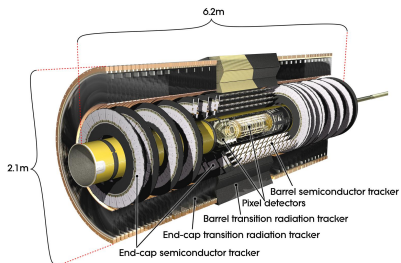
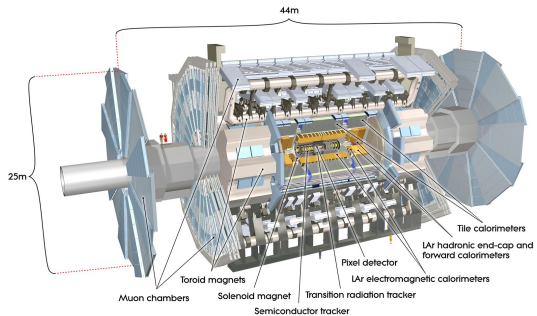
# Type Inversion



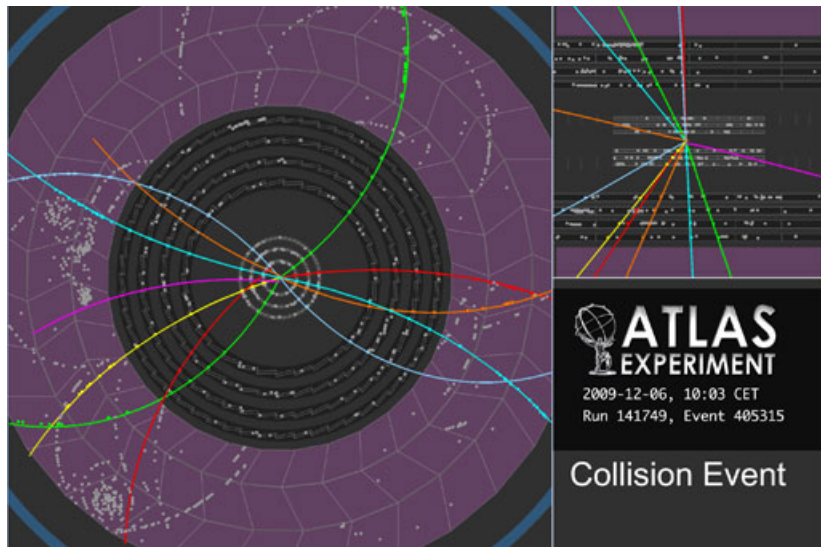
## 3D detectors

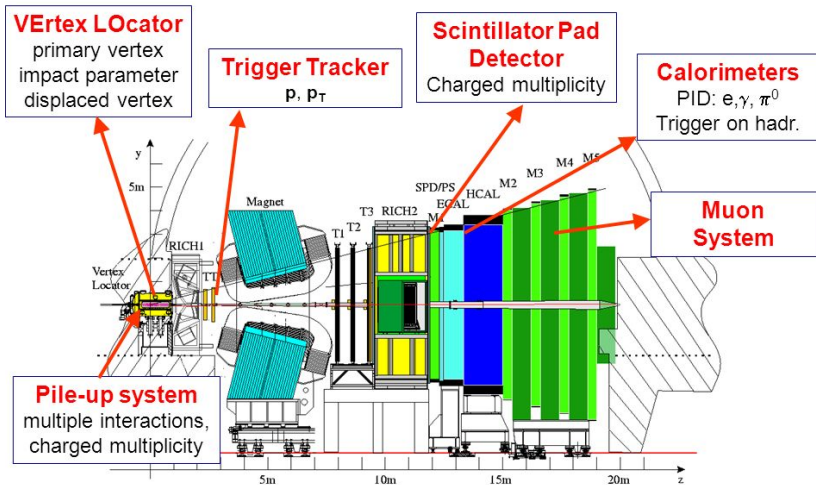






# Track reconstruction





# LHCb VELO

