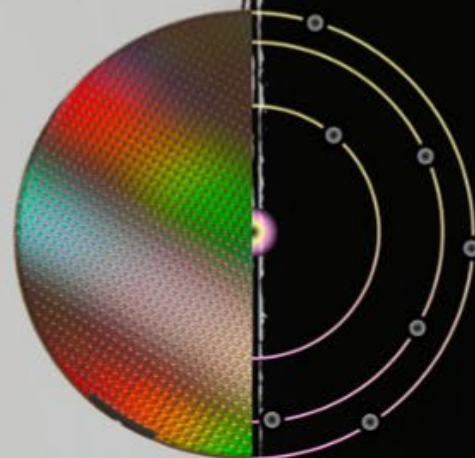




# Nuclear Physics meets Electronic Technology



# ASBEST

A 7-Beryllium electron capture Study for nuclear and solid state physics

**Hands-On: Identification of the composition and thickness of the surface layers of a Schottky diode using a 4He charged particle beam.**

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# Materials

- **Cal.txt file**
  - Spectra obtained with a beam  ${}^4\text{He}^{1+}$  of 2 MeV.
  - Target with know compositions: Thick Carbon foil (~1 mm) , a thin layer of Au and a Thin layer of Al.
  - Charge accumulated= 33  $\mu\text{C}$ .
- **SIC\_exp\_7degree\_2\_MeV.txt file**
  - Spectra obtained with a beam of  ${}^4\text{He}^{1+}$  of 2 MeV.
  - Schottky SIC diode.
  - Charge accumulated= 52  $\mu\text{C}$ .
- **SIC\_exp\_7degree\_5\_MeV.txt file**
  - Spectra obtained with a beam of  ${}^4\text{He}^{1+}$  of 5 MeV.
  - Schottky SIC diode.
  - Charge accumulated= 0.52  $\mu\text{C}$ .
- **SIMNRA-Users-Guide.pdf**
- **SIMNRA software**

# Objectives

- Create a new setup (Experiment, Calculation) (from pag. 19 of user guide).
- Import Cal.txt file
  - Complete the setup (Target, Reactions) .
  - Calibrate the detector.
- Import SIC\_exp\_7degree\_2\_MeV.txt file
  - Complete the setup (Target, Reactions) .
  - Create a diode target based on information available. Fit the experimental curve modifying the target.
- Import SIC\_exp\_7degree\_5\_MeV.txt file
  - Complete the setup (Target, Reactions) .
  - Create a diode target based on information available. Fit the experimental curve modifying the target.

# ***Information***

- **Silicon detector and geometry**
  - **50 mm<sup>2</sup>**
  - **Distance 10 cm**
  - **Resolution 25 keV**
  - **Exit Angle 7°C - IBM geometry**
  
- **SiC Diode**
  - **SiC bulk**
  - **Ohmic contact typically is made with two or more element from Ti, Ni, Al, Au.**  
**Interact with the expert for more details!**