

# Scanning electron microscopy

Prepared by a student

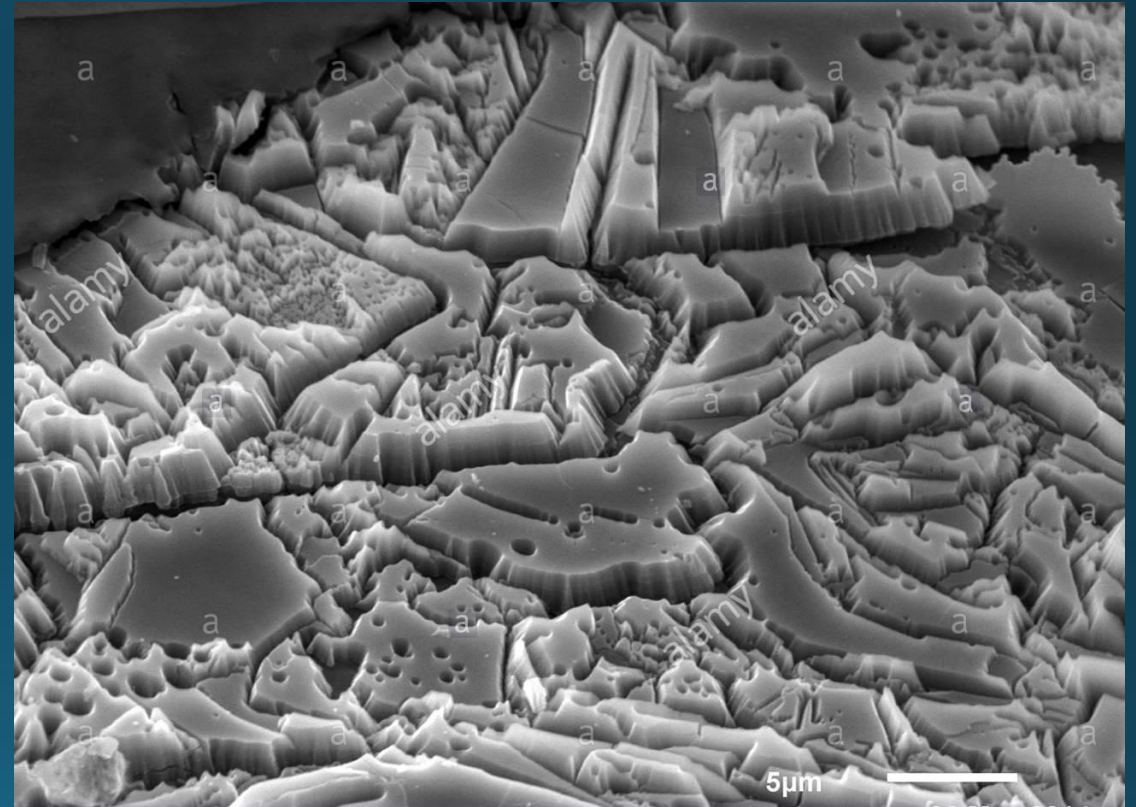
g.33339/1

Raziapov Timur

# scanning electron microscope



JSM-7610F Schottky Field Emission Scanning Electron Microscope

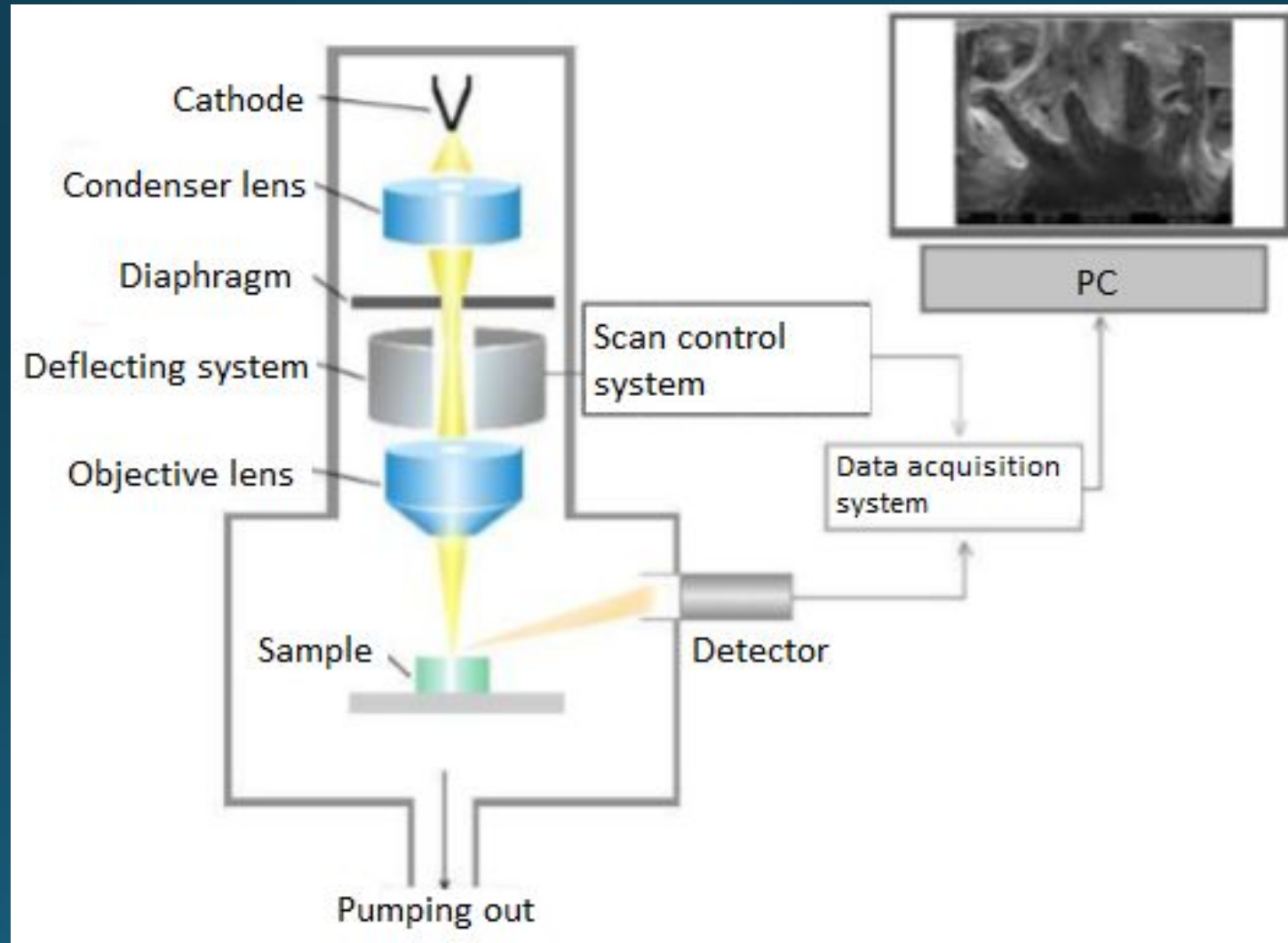


alamy stock photo

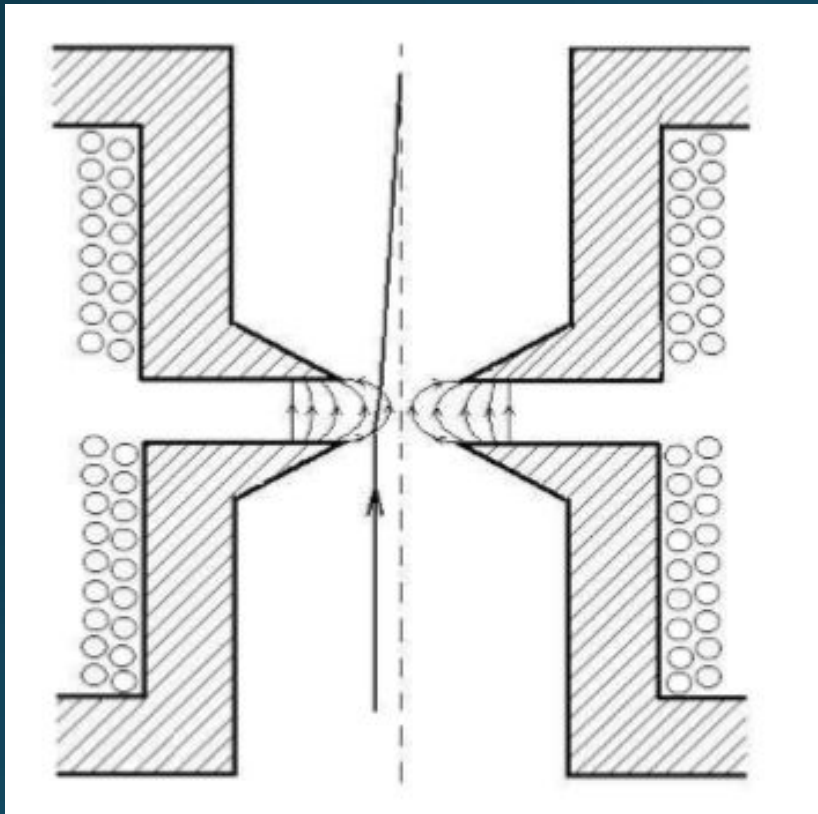
E1H6CT  
www.alamy.com

iron oxide formations with sulphur and chlorine present

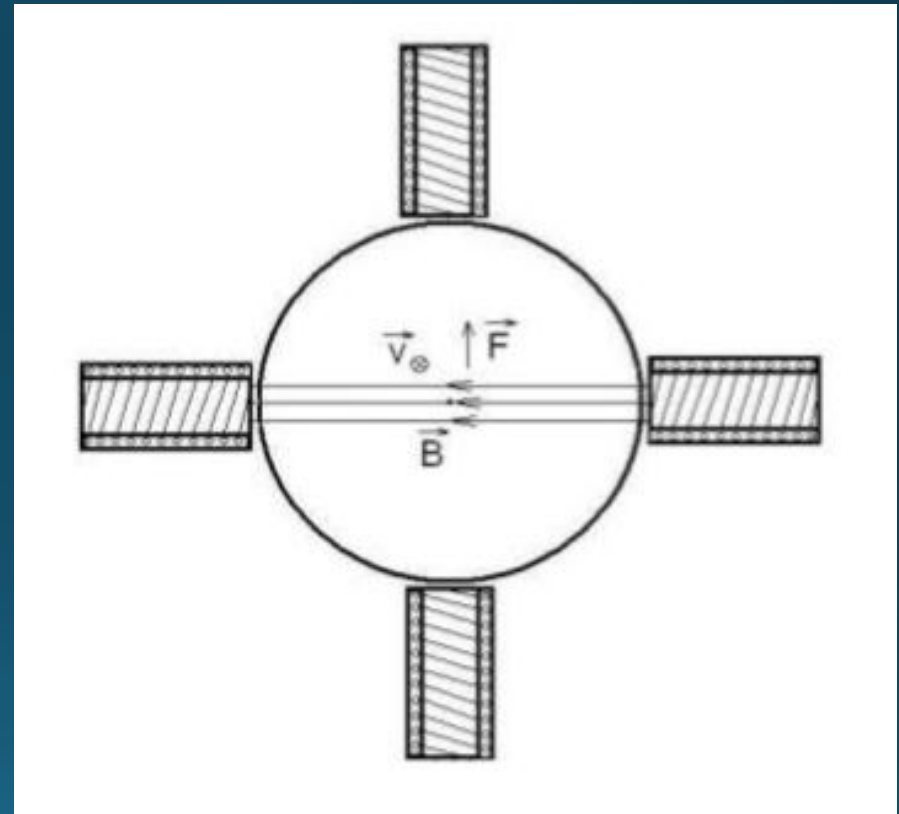
# Schematic diagram SEM



# Electronic optics



Magnetic lens

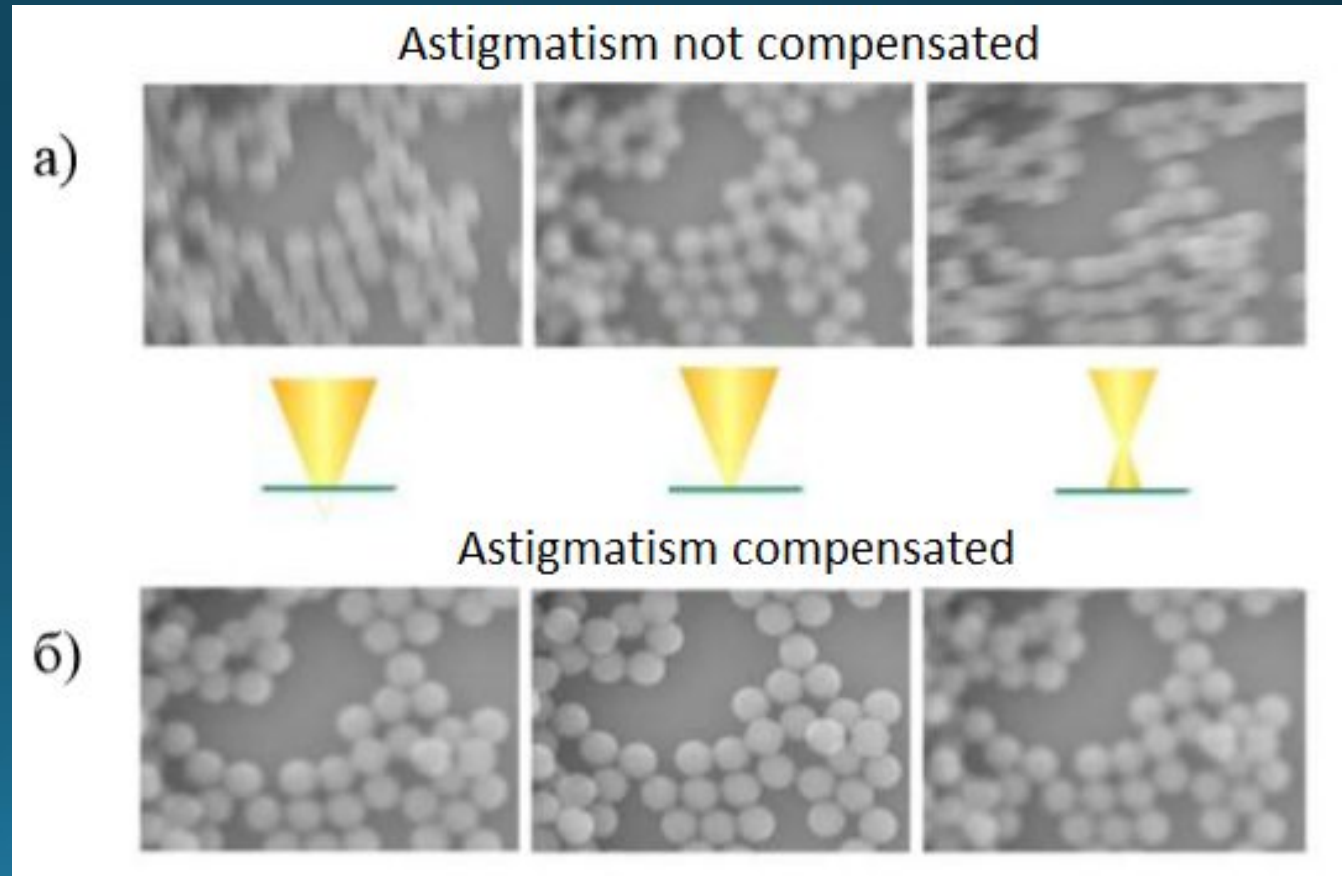


Magnetic deflection system

# Factors that impair Magnification

- aberrations (spherical and chromatic)
- electron diffraction
- Astigmatism

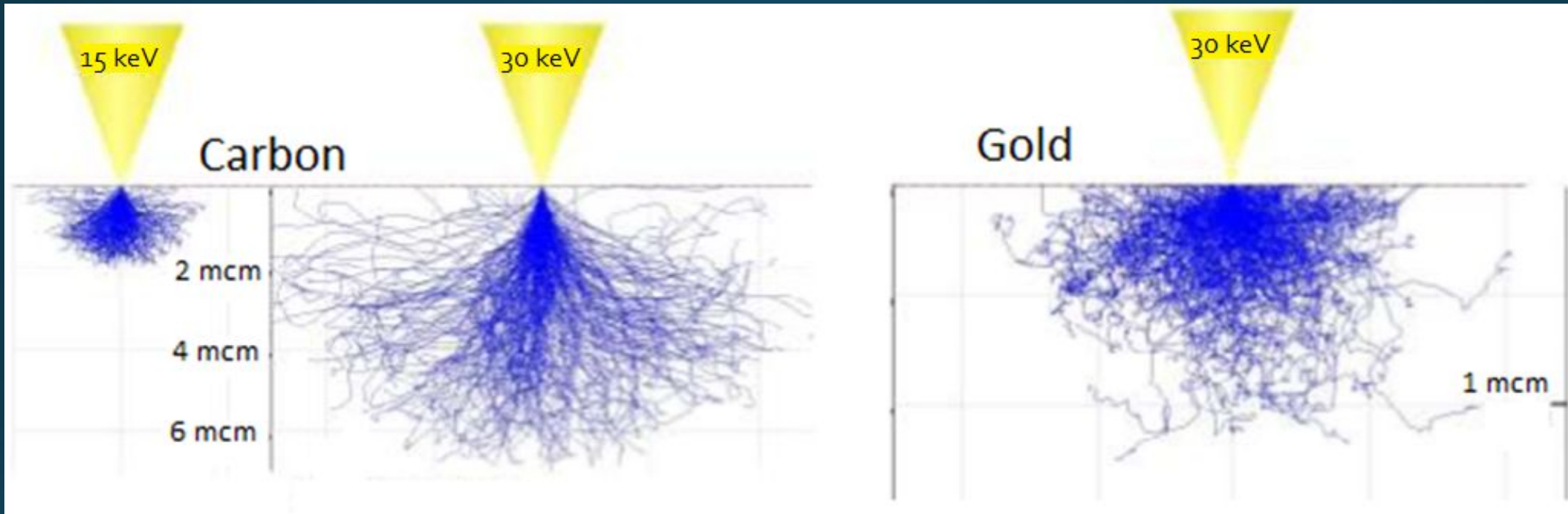
Blurring the image when focusing above and below the sample in the presence of astigmatism (a) and without astigmatism (b).



# Main types of signals SEM

- secondary electrons
- BSE - backscattered electrons
- x-rays

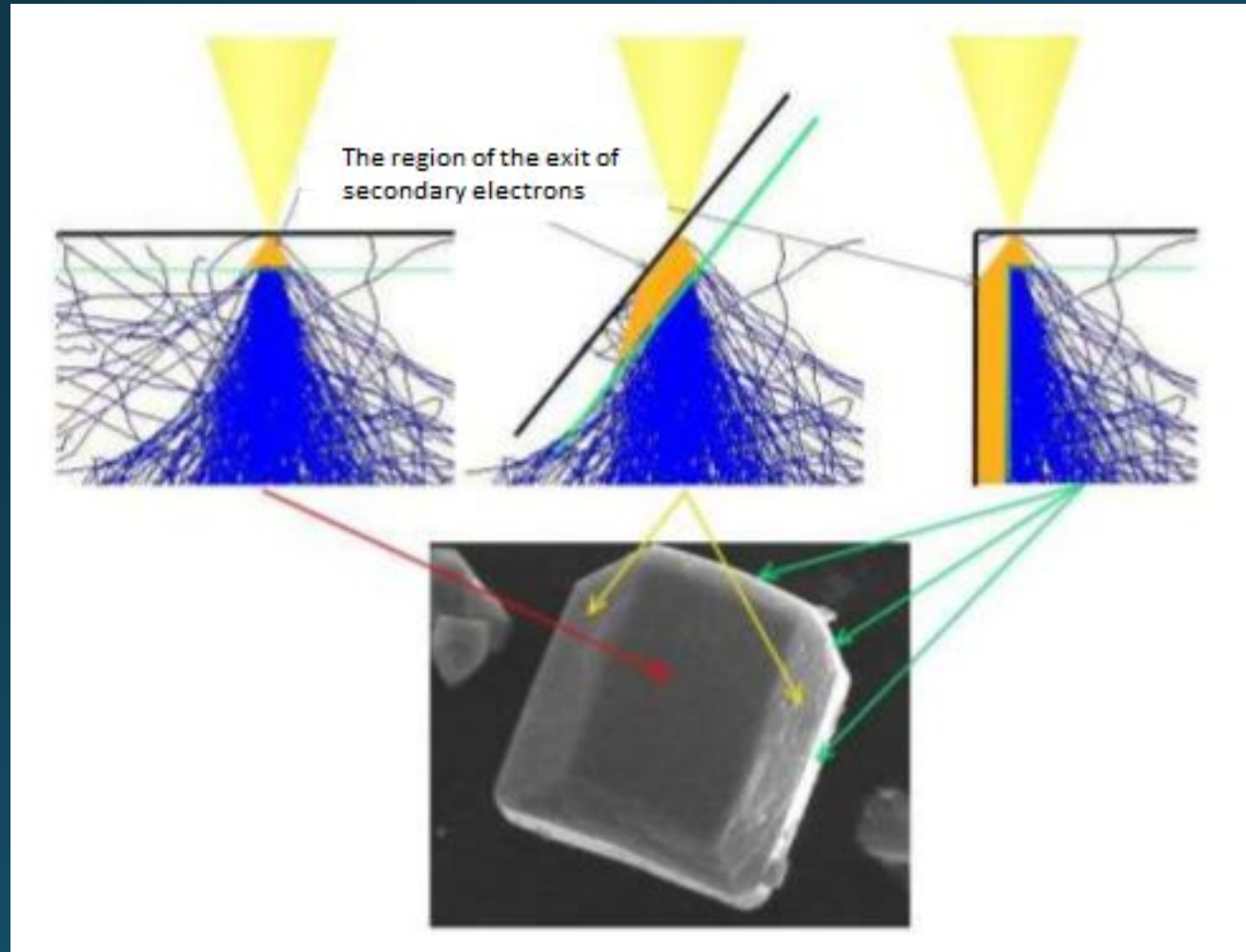
# Main types of signals SEM



## Scattering of electrons in various materials

(Hereinafter, the numerical simulation of the trajectories was performed using the MonteCarlo simulation of electron trajectory in solids software package "CASINO")

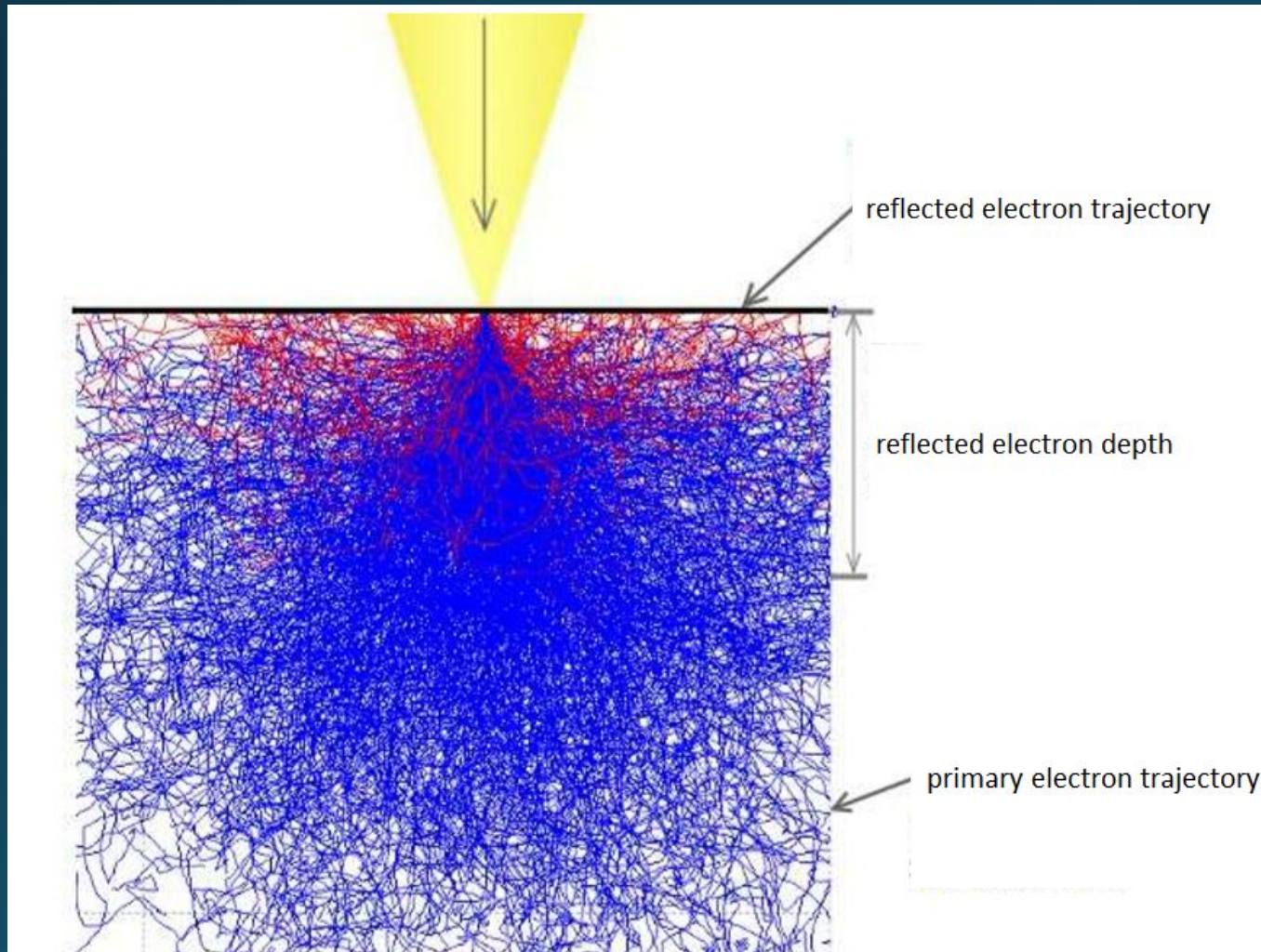
# Main types of signals SEM



The yield of secondary electrons at different angles of incidence.

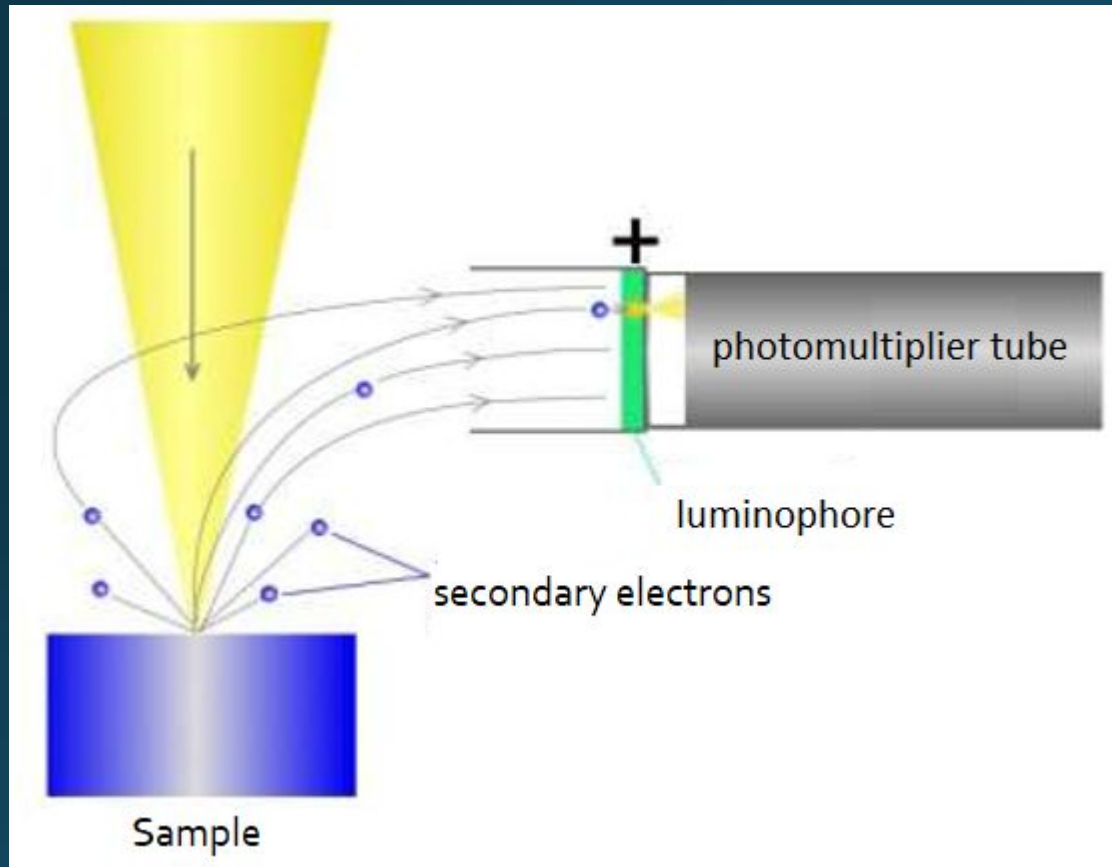


# Main types of signals SEM



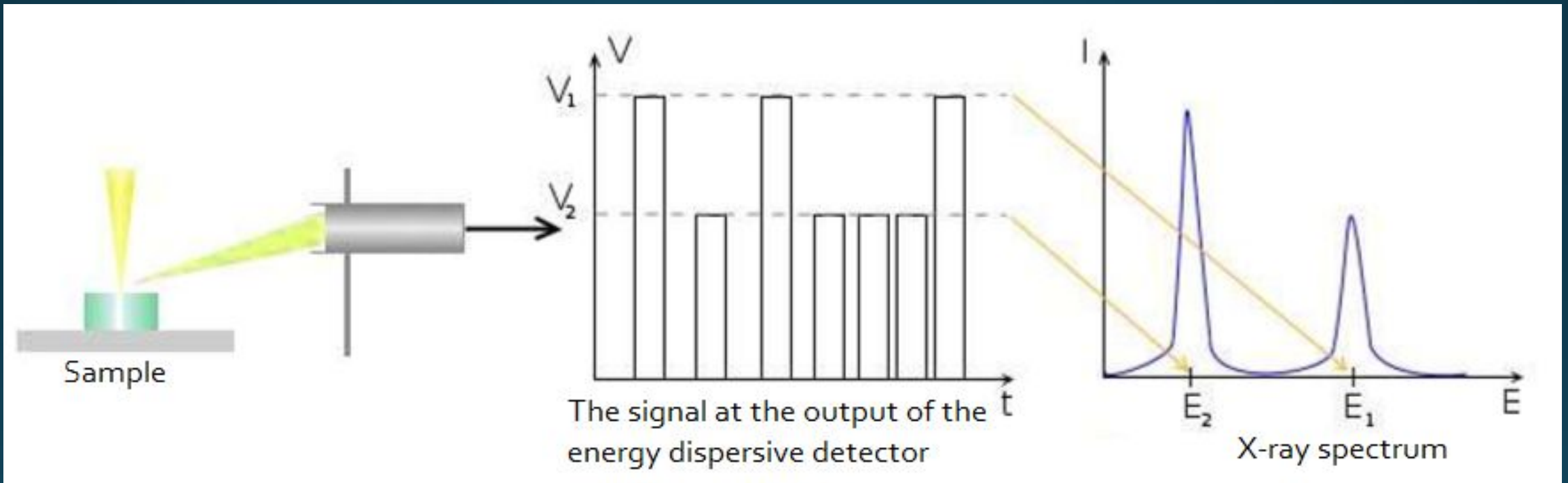
Backscattered (reflected) electrons

# Detector electrons



Detection of secondary electrons.

# Detector electrons



Energy Dispersive X-ray Detector

**Thanks for your**



**Attention**