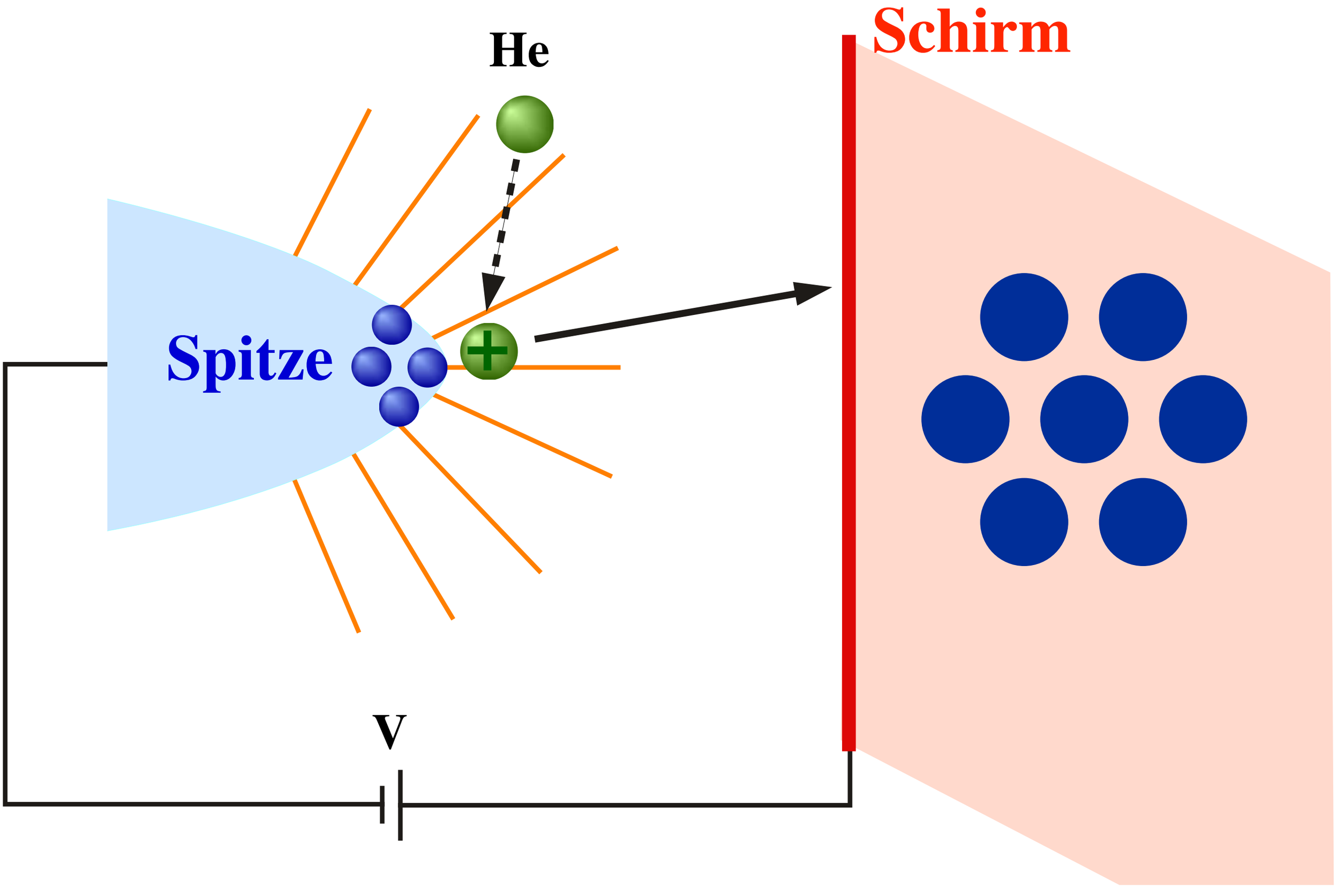
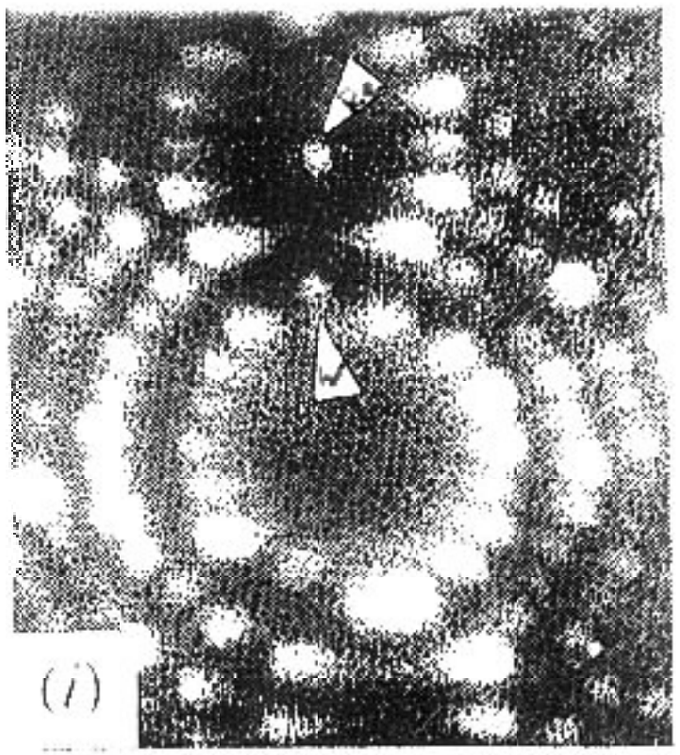
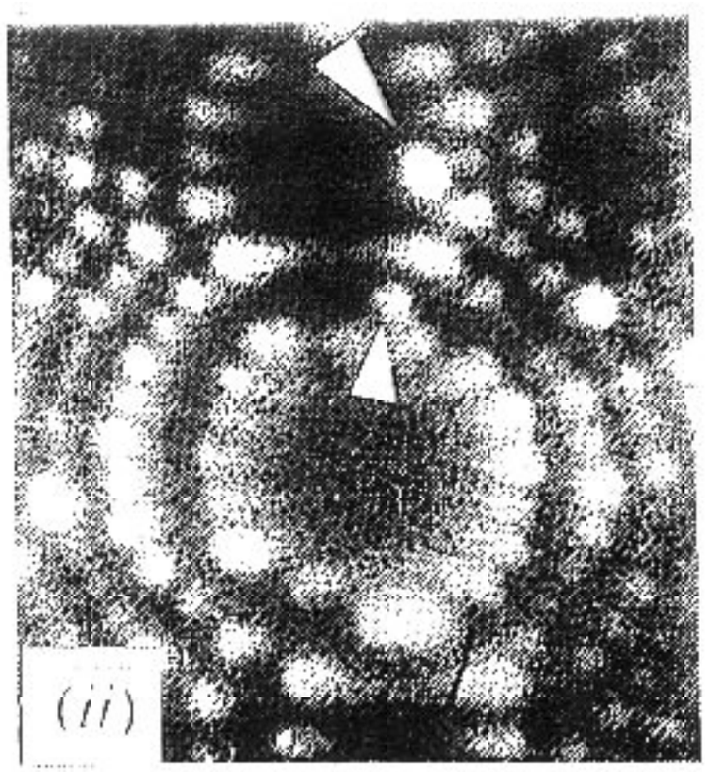
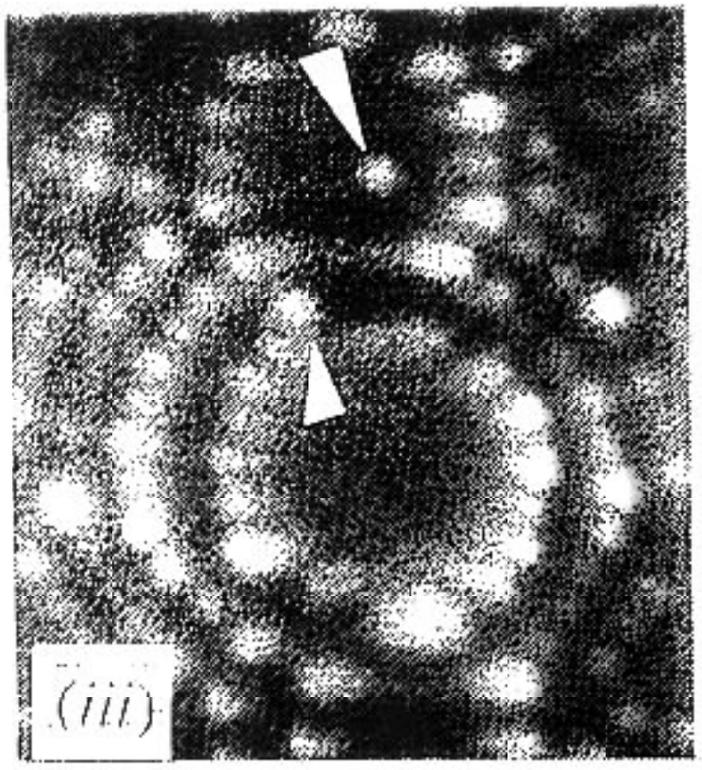
Feldionen Mikroskop

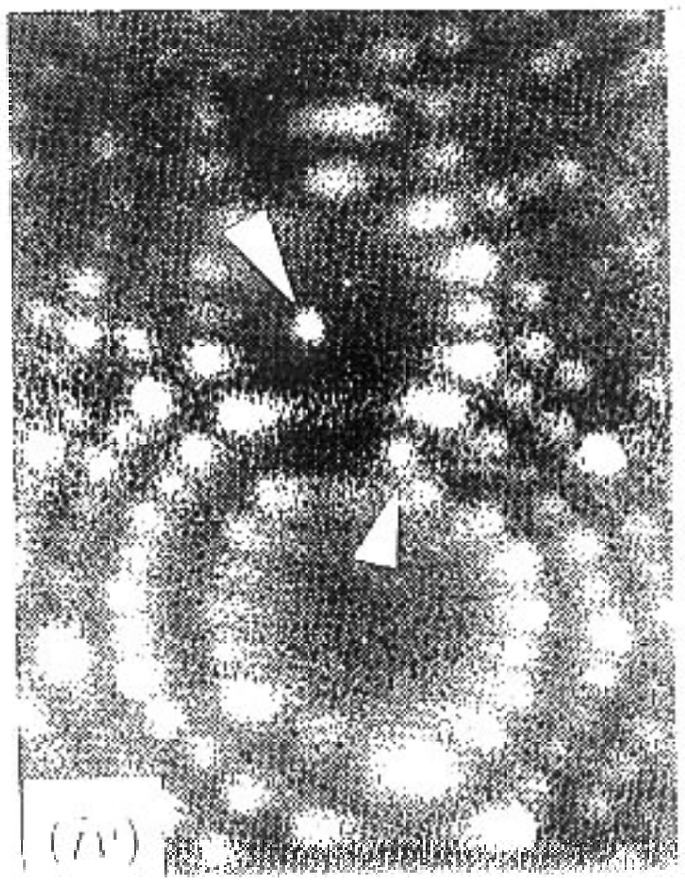


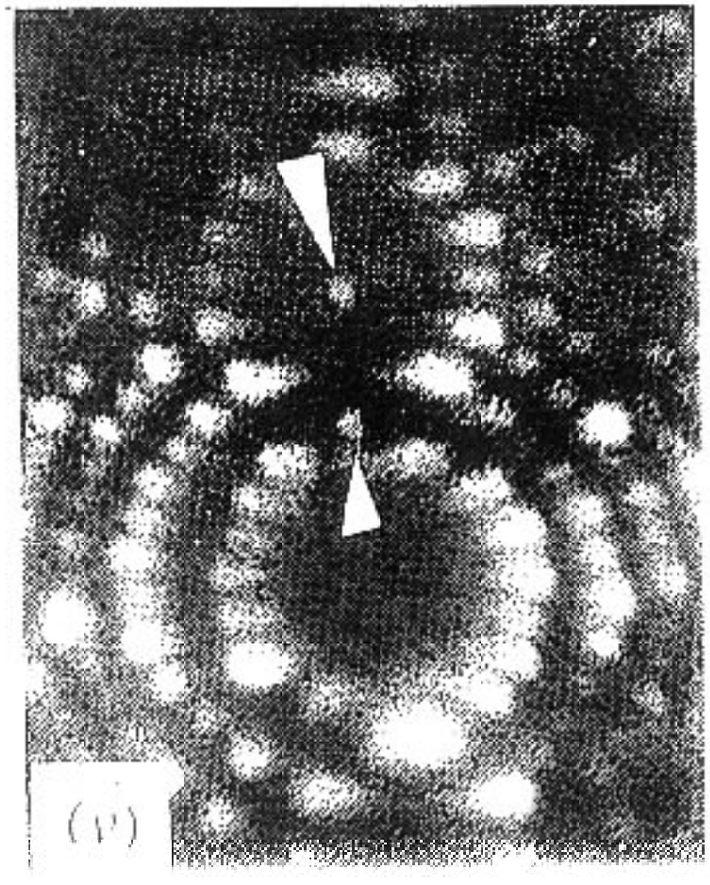
Feldionen - Bilder

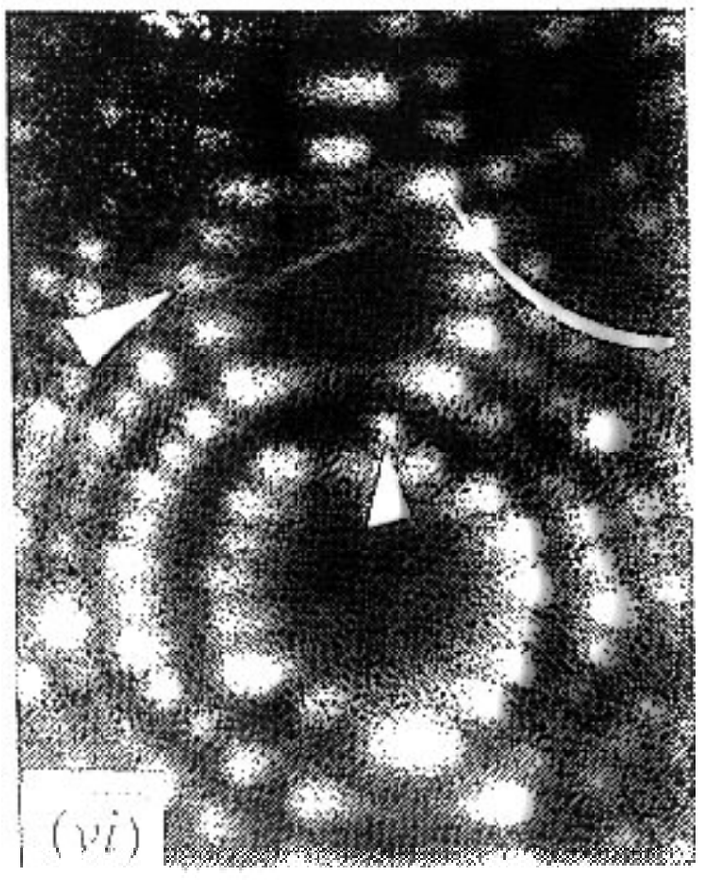




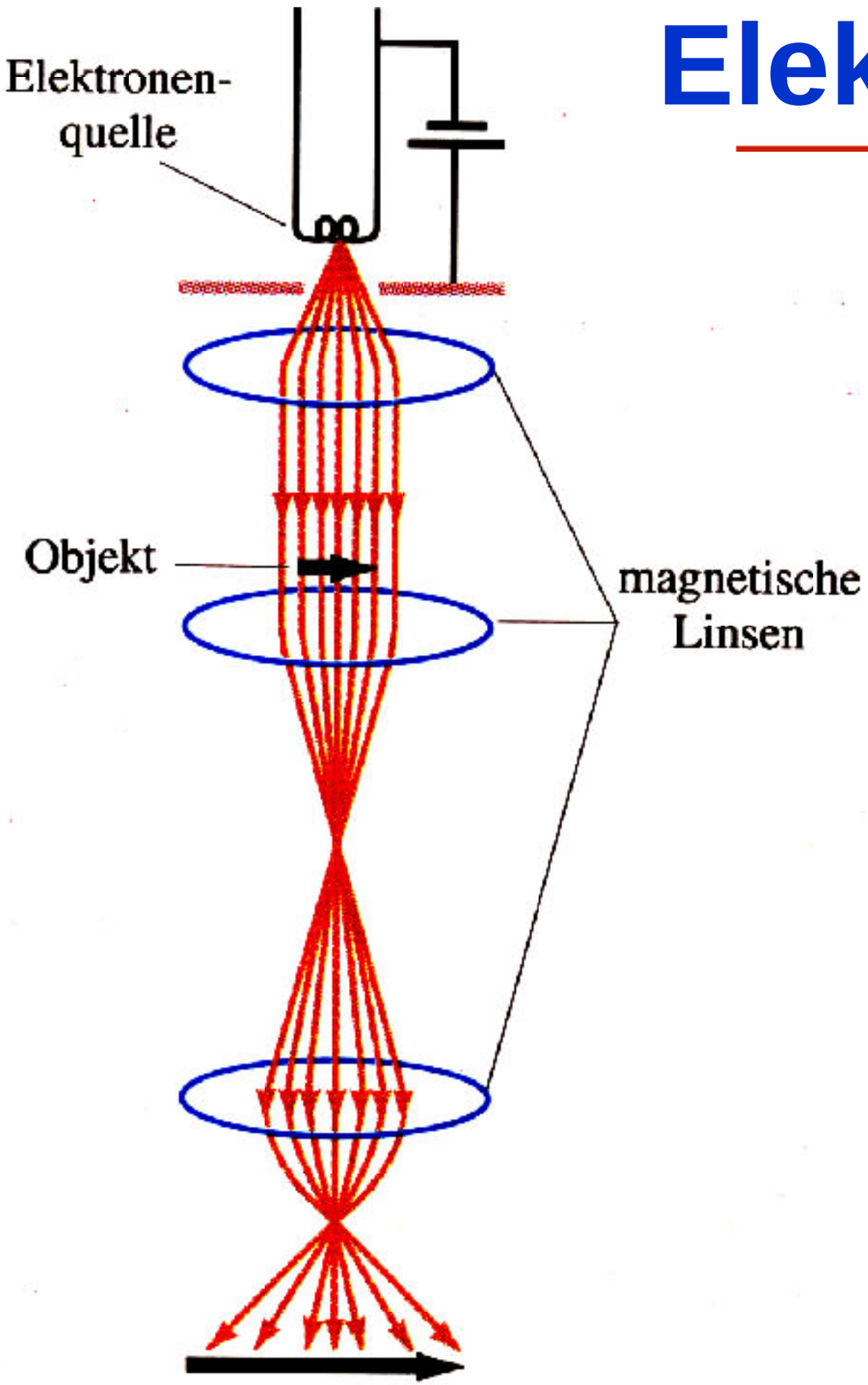


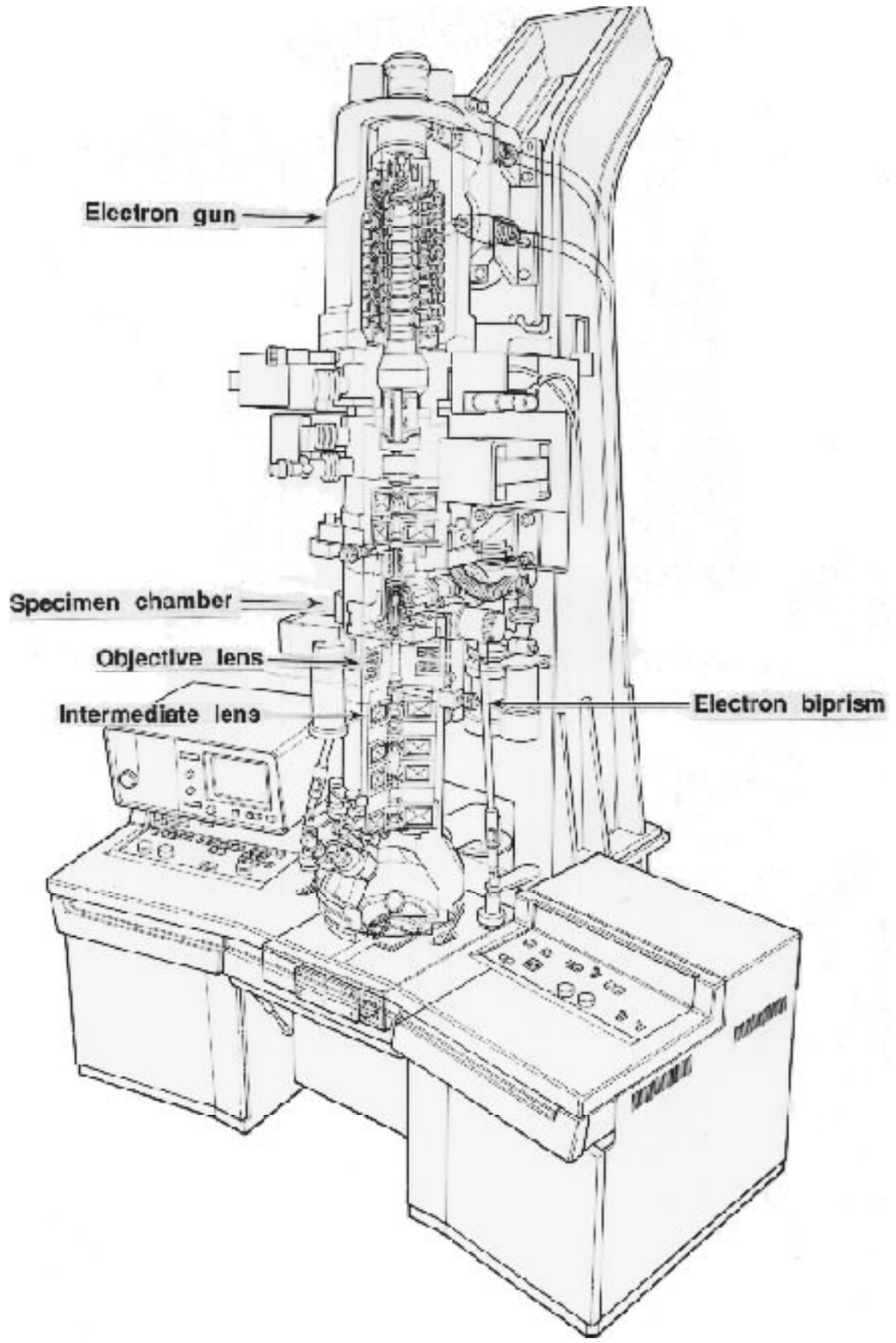




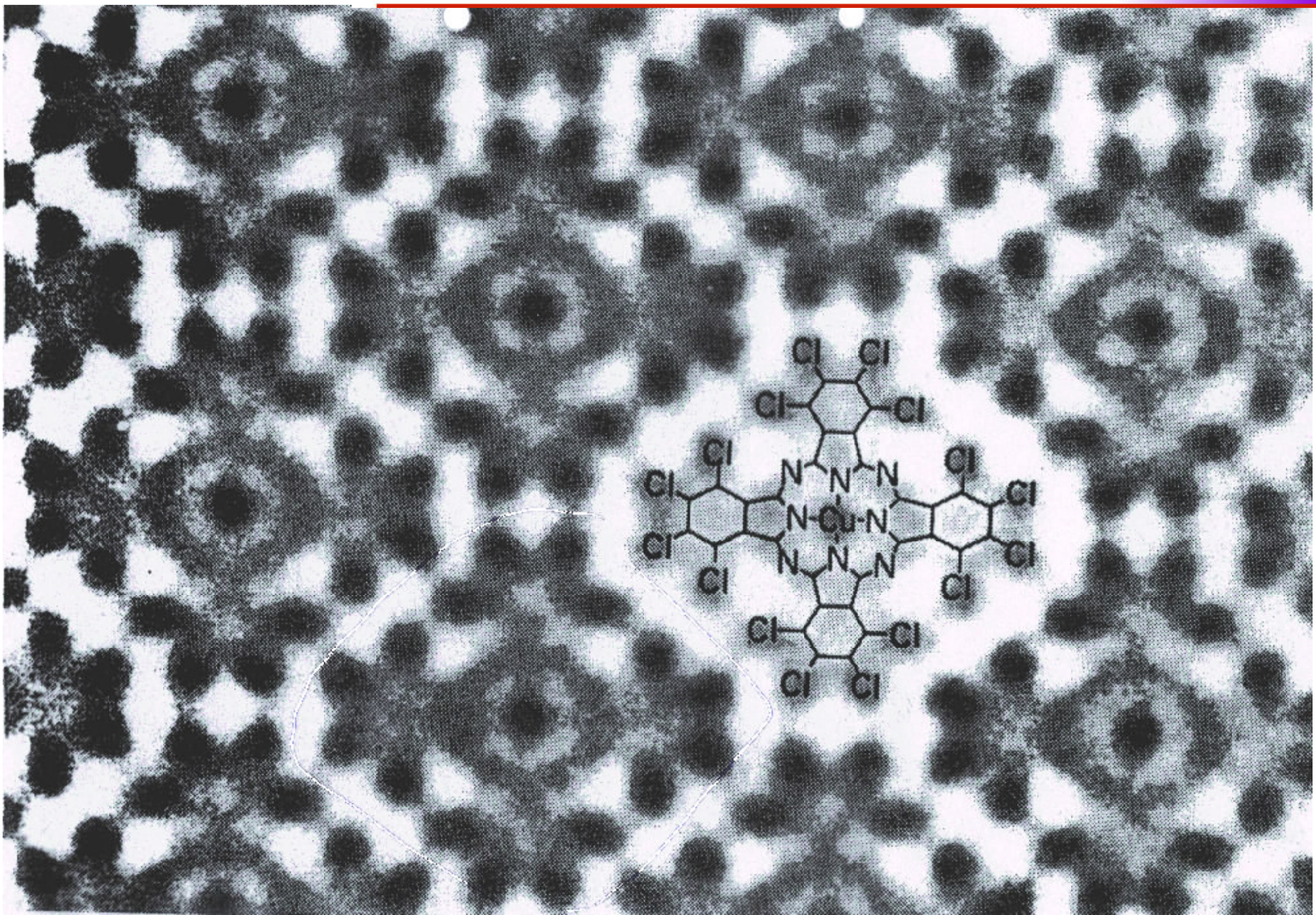


Elektronen Mikroskop

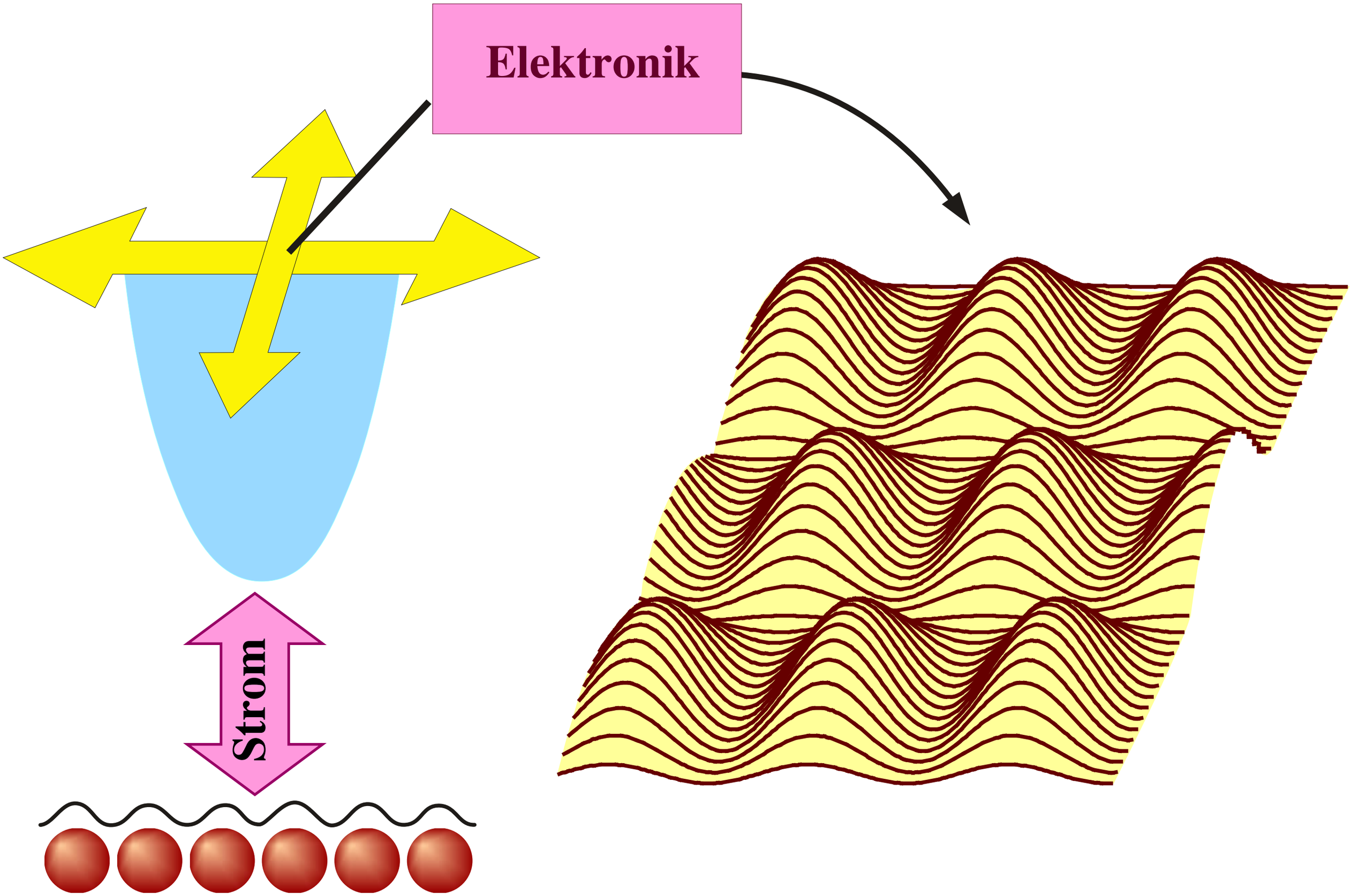




Transmissions - Elektronenmikroskopie

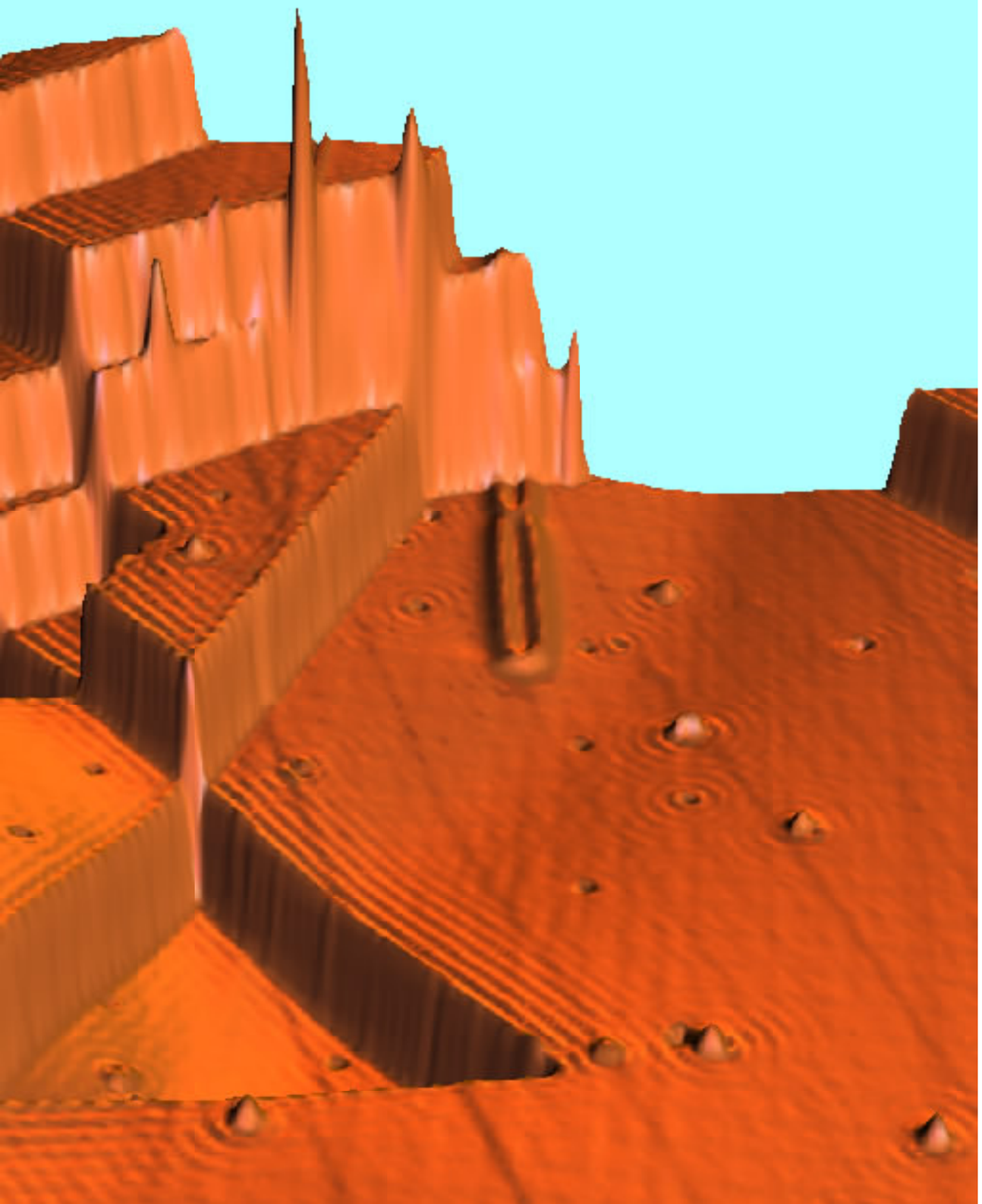


Raster-Tunnelmikroskopie



Tunnelmikroskopie

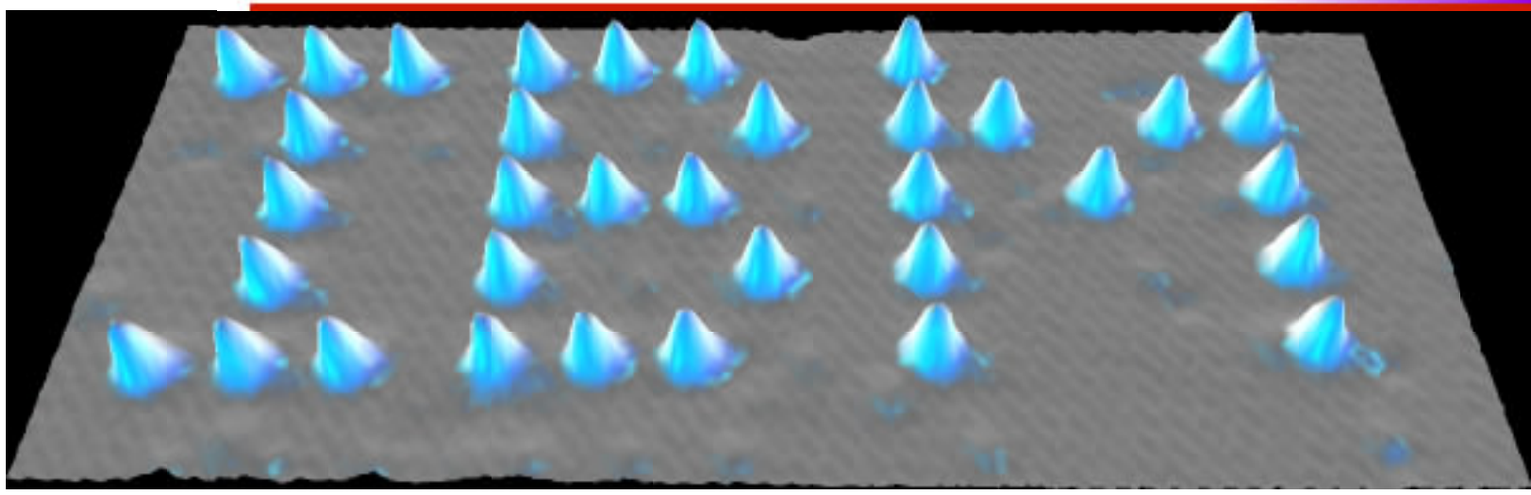
Cu (111)



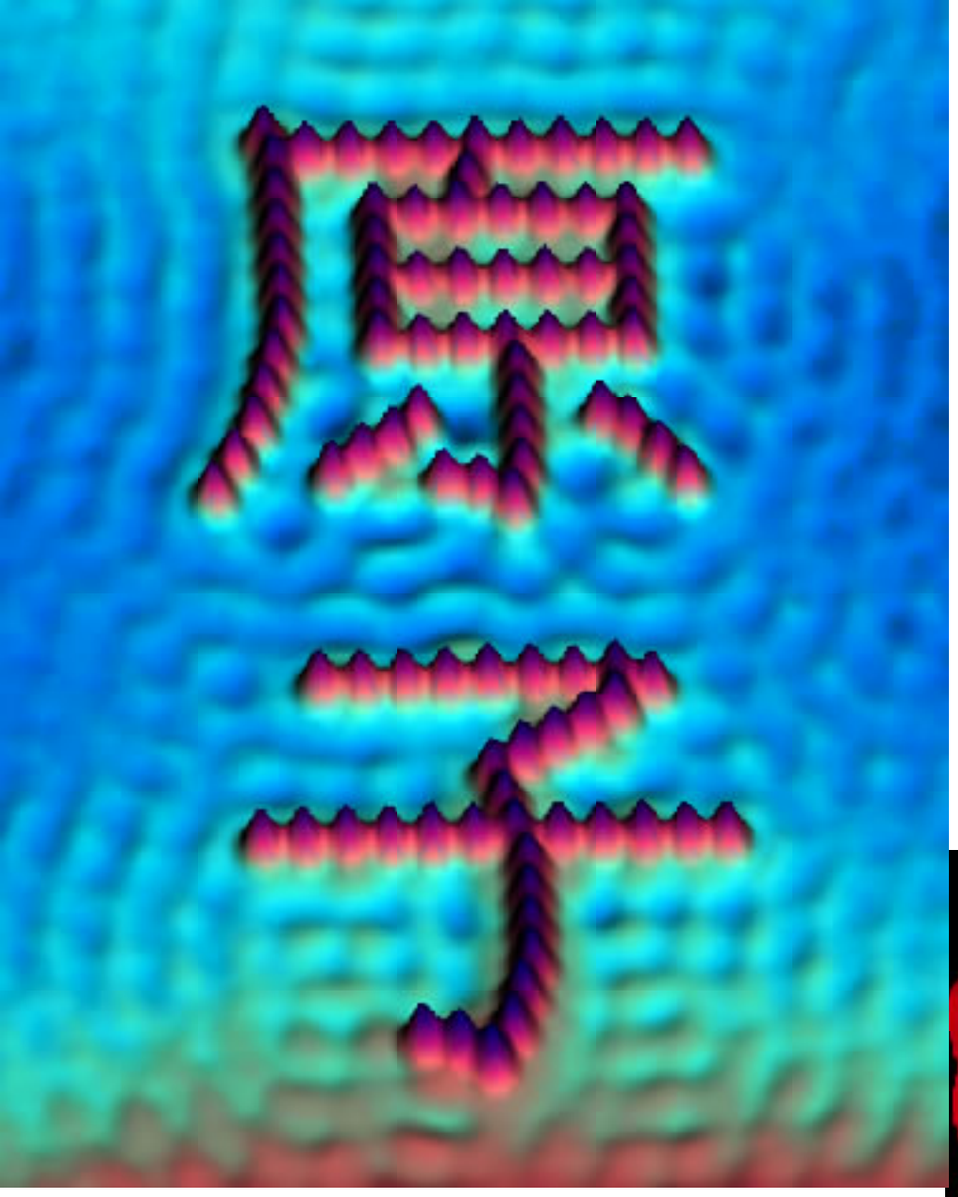
“Reminiscent of formal Japanese rock gardens, here we see ripples surrounding features on the copper (111) surface. The artists‘ fortunes took a major turn upward when they determined that the ripples were due to “surface state electrons.” These electrons are free to roam about the surface but not to penetrate into the solid. When one of these electrons encounters an obstacle like a step edge, it is partially reflected. The ripples extending away from the step edges and the various defects in the crystal surface are just the standing waves that are created whenever a wave scatters off of something. The standing waves are about 15 Angstroms (roughly 10 atomic diameters) from crest to crest. The amplitude is largest adjacent to the step edge where it is about 0.04 Angstroms from crest to trough.”

M.F. Crommie, C.P. Lutz, and D.M. Eigler, *IBM*

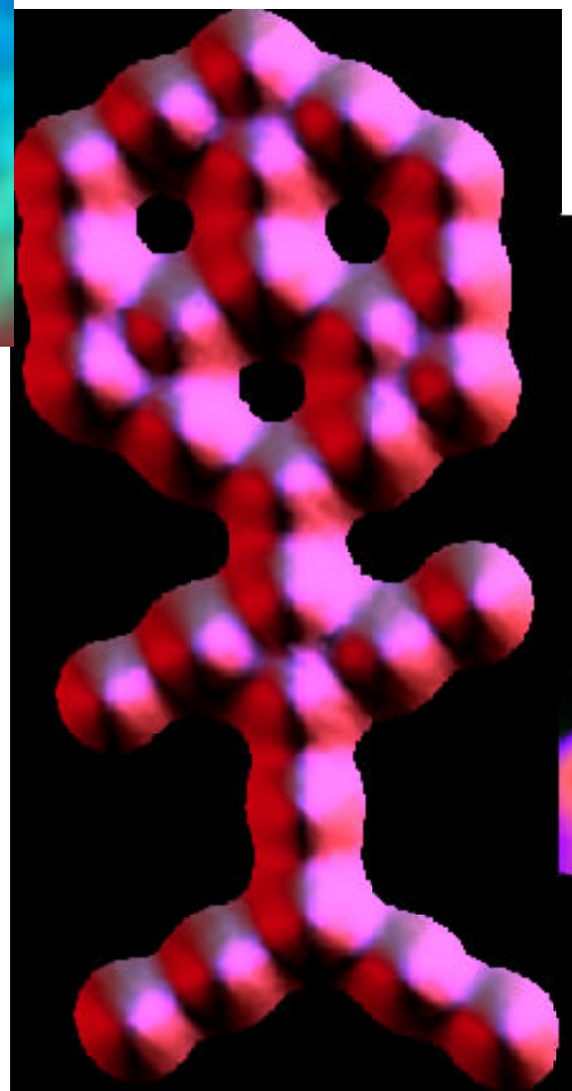
Tunnelmikroskopie



Title : The Beginning
Media : Xenon on Nickel (110)

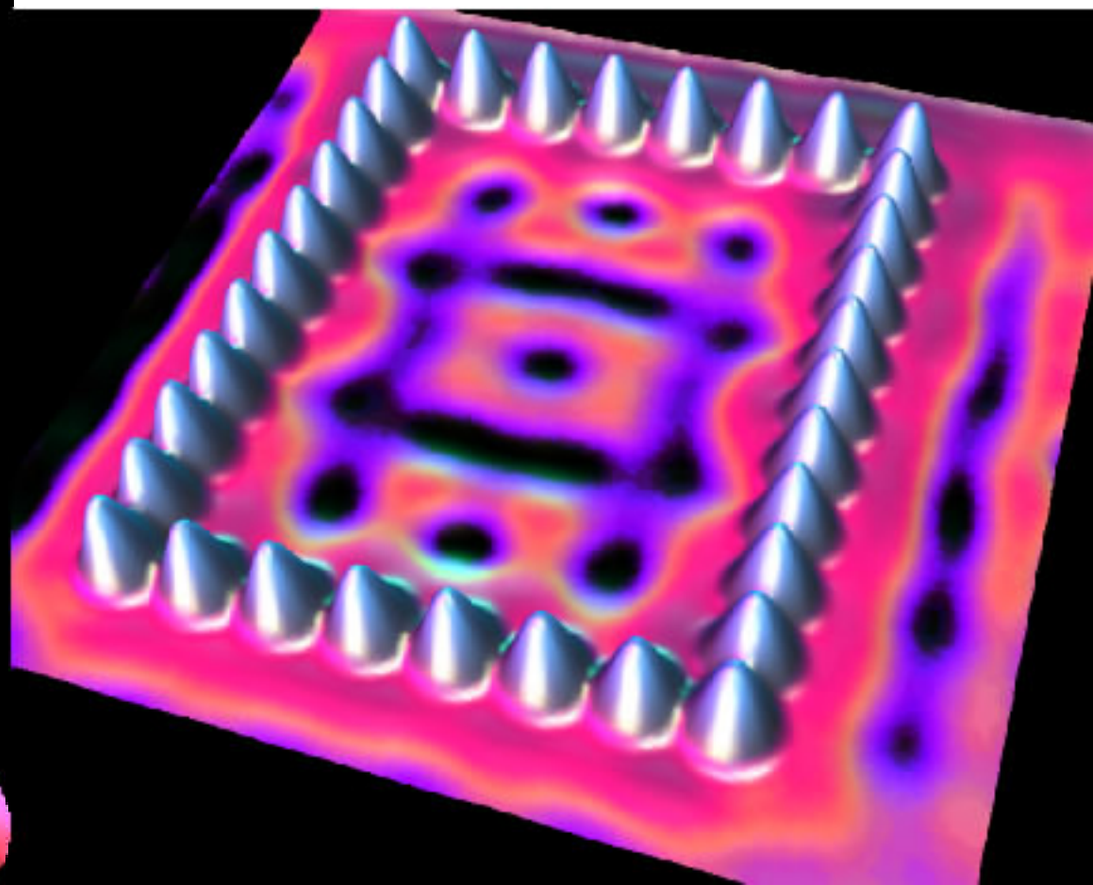


Title: Atom
Media: Iron on Copper (111)

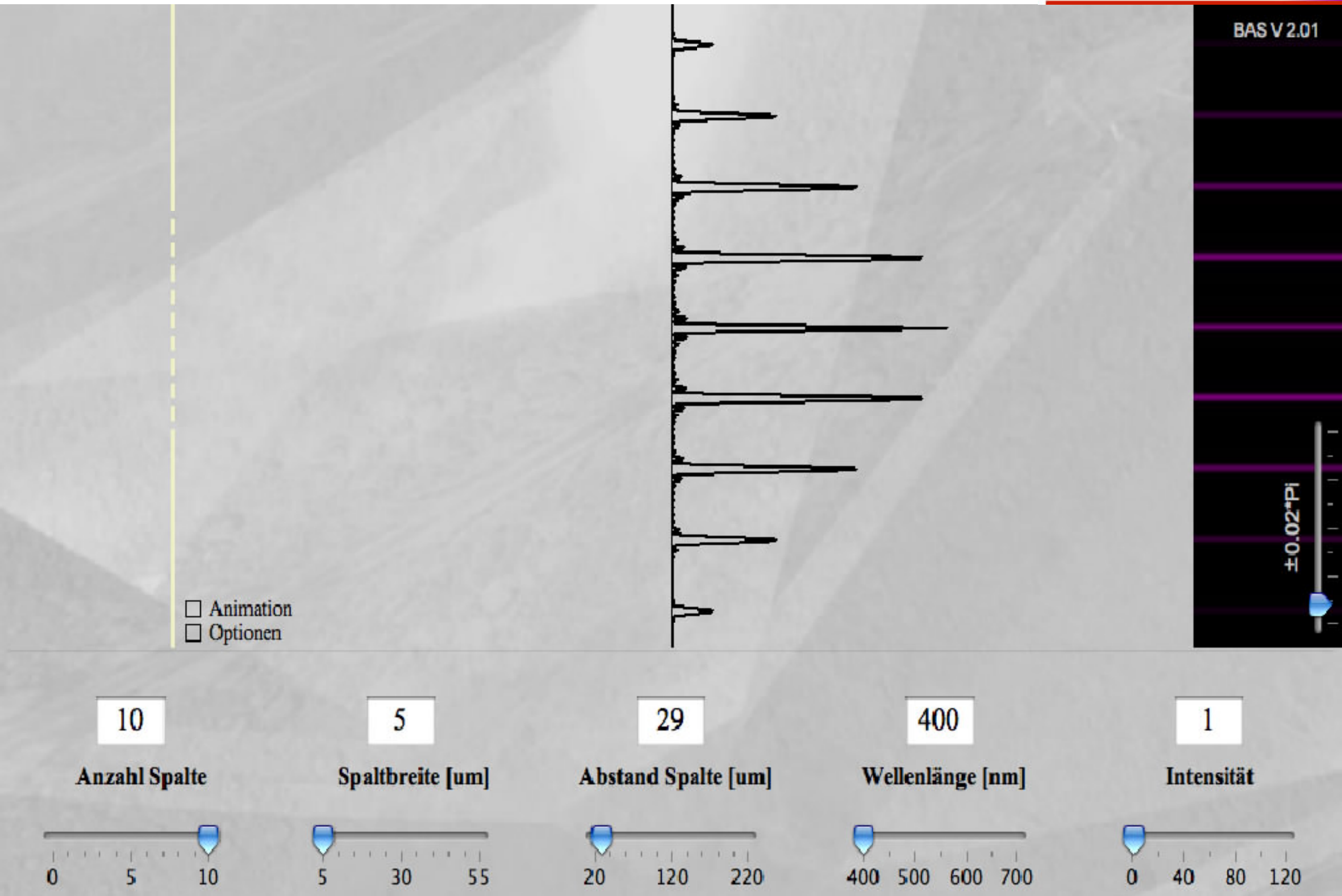


Title : Carbon Monoxide Man
Media : Carbon Monoxide
on Platinum (111)

Title : Rectangular Corral
Media : Iron on Copper (111)

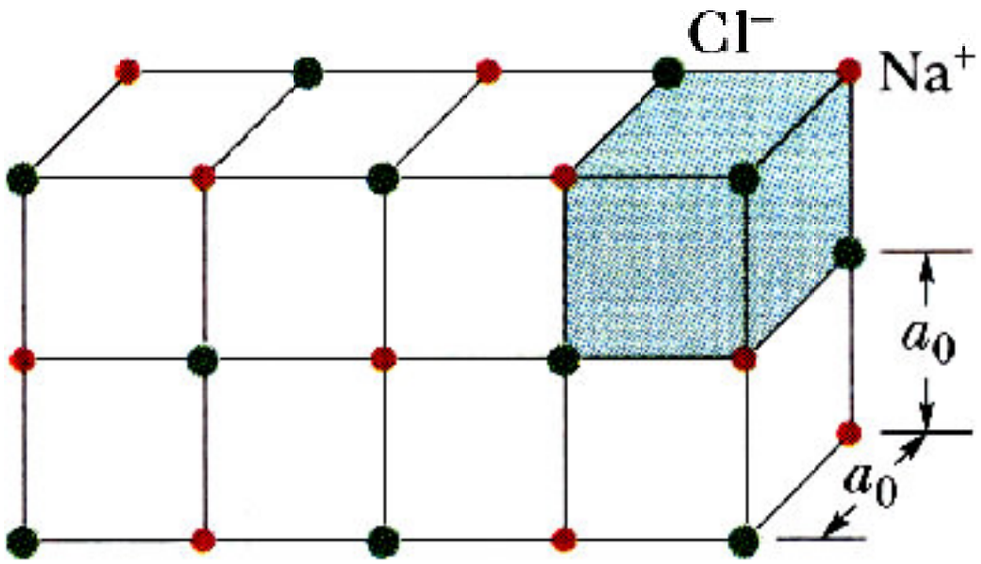


Beugung

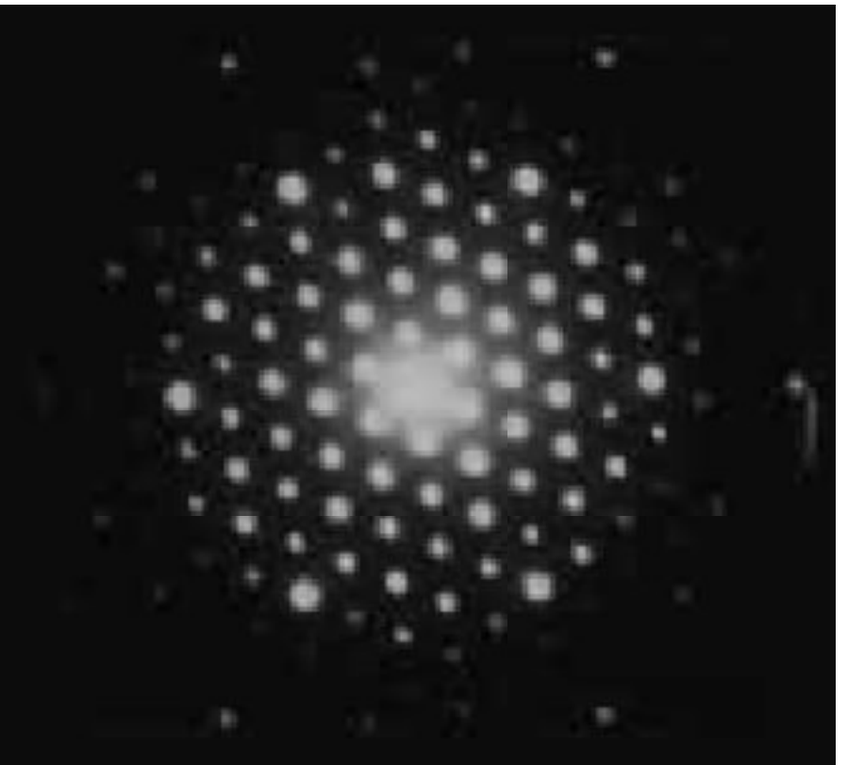

BAS V 2.01
±0.02*Pi
Animation
Optionen
10
Anzahl Spalte
0
5
10
5
Spaltbreite [um]
5
30
55
29
Abstand Spalte [um]
20
120
220
400
Wellenlänge [nm]
400
500
600
700
1
Intensität
0
40
80
120

Reflexion an Netzebenen

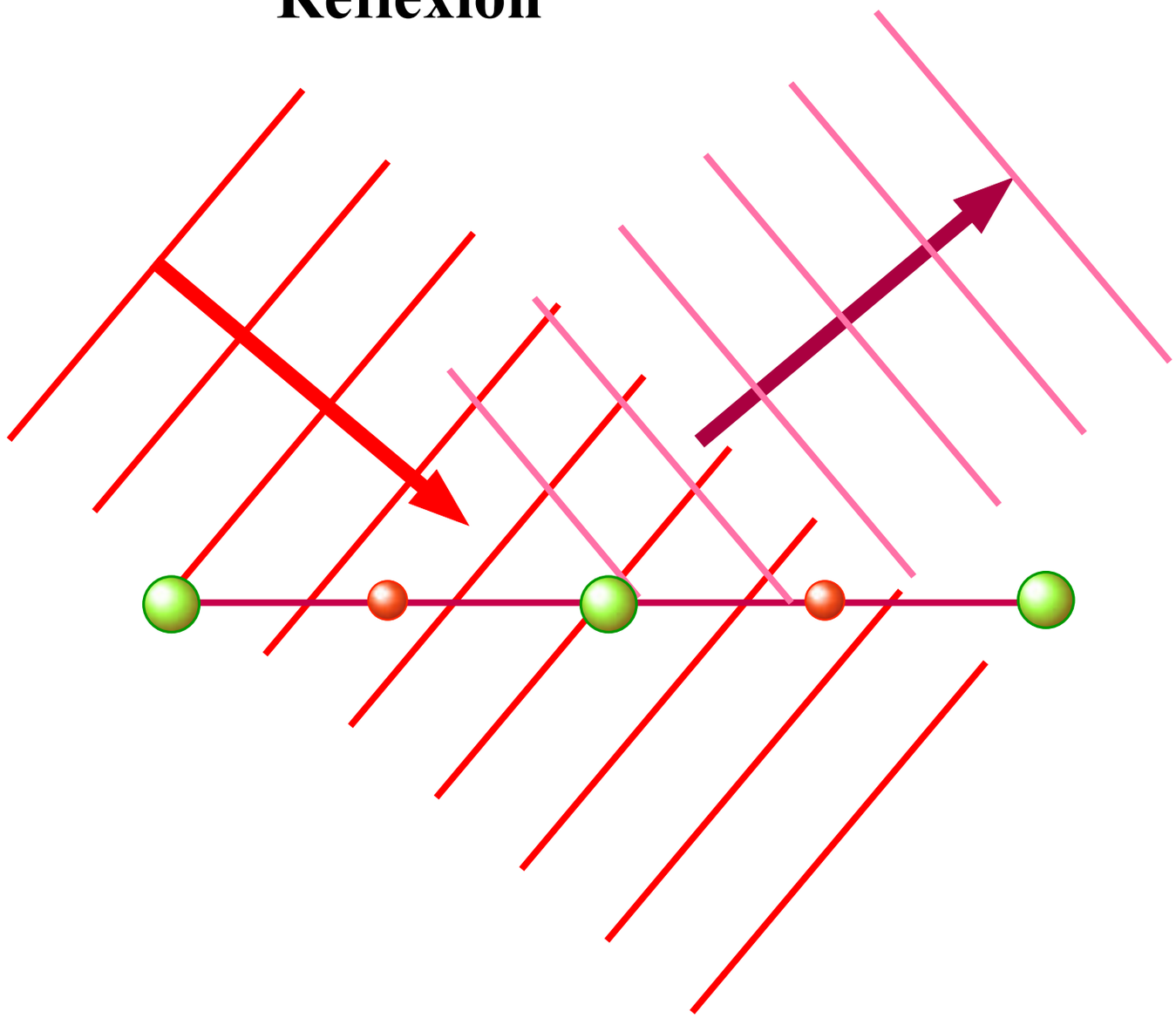
Kristall = 3D Beugungsgitter



Beugungsmuster von MoO_3

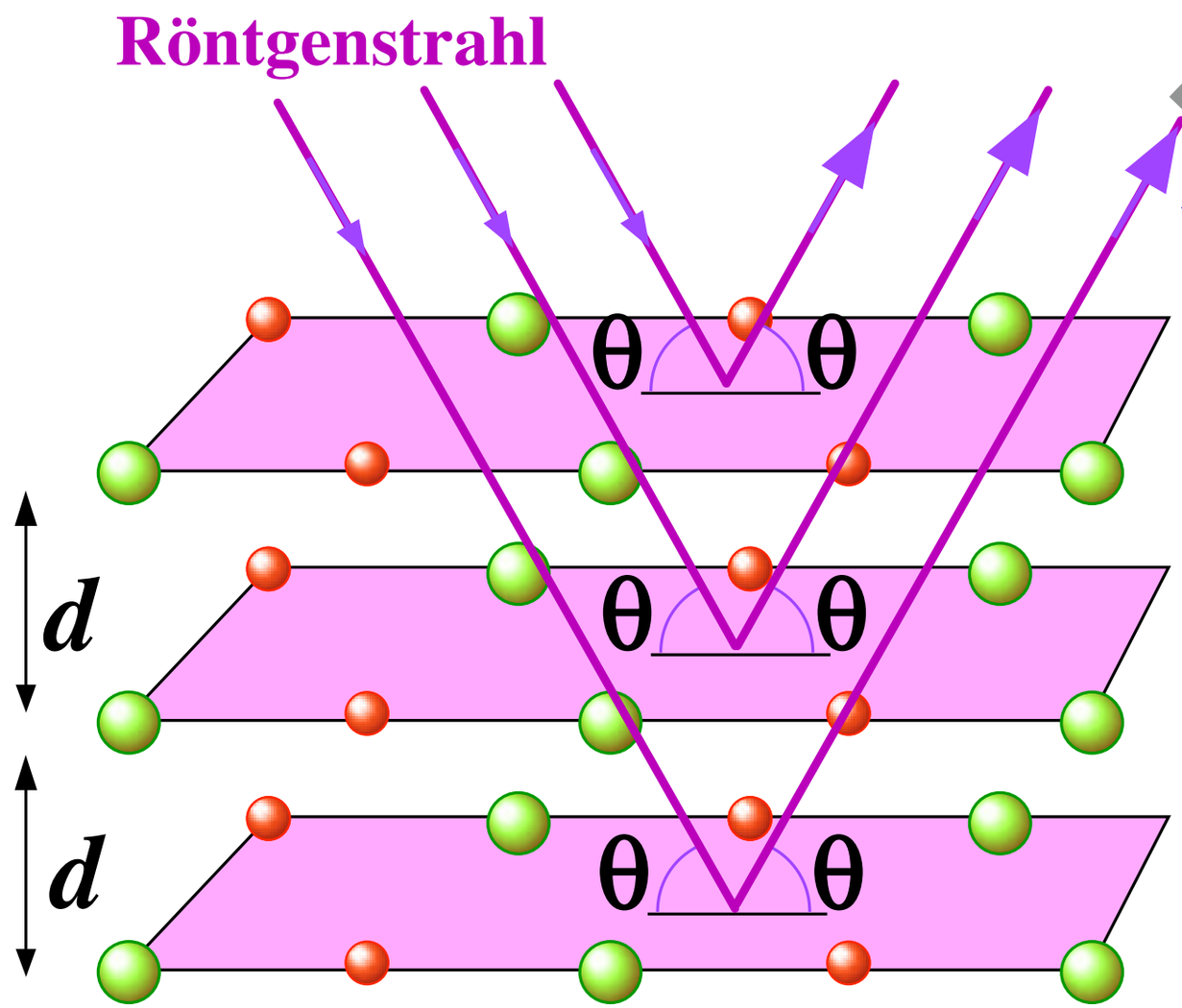


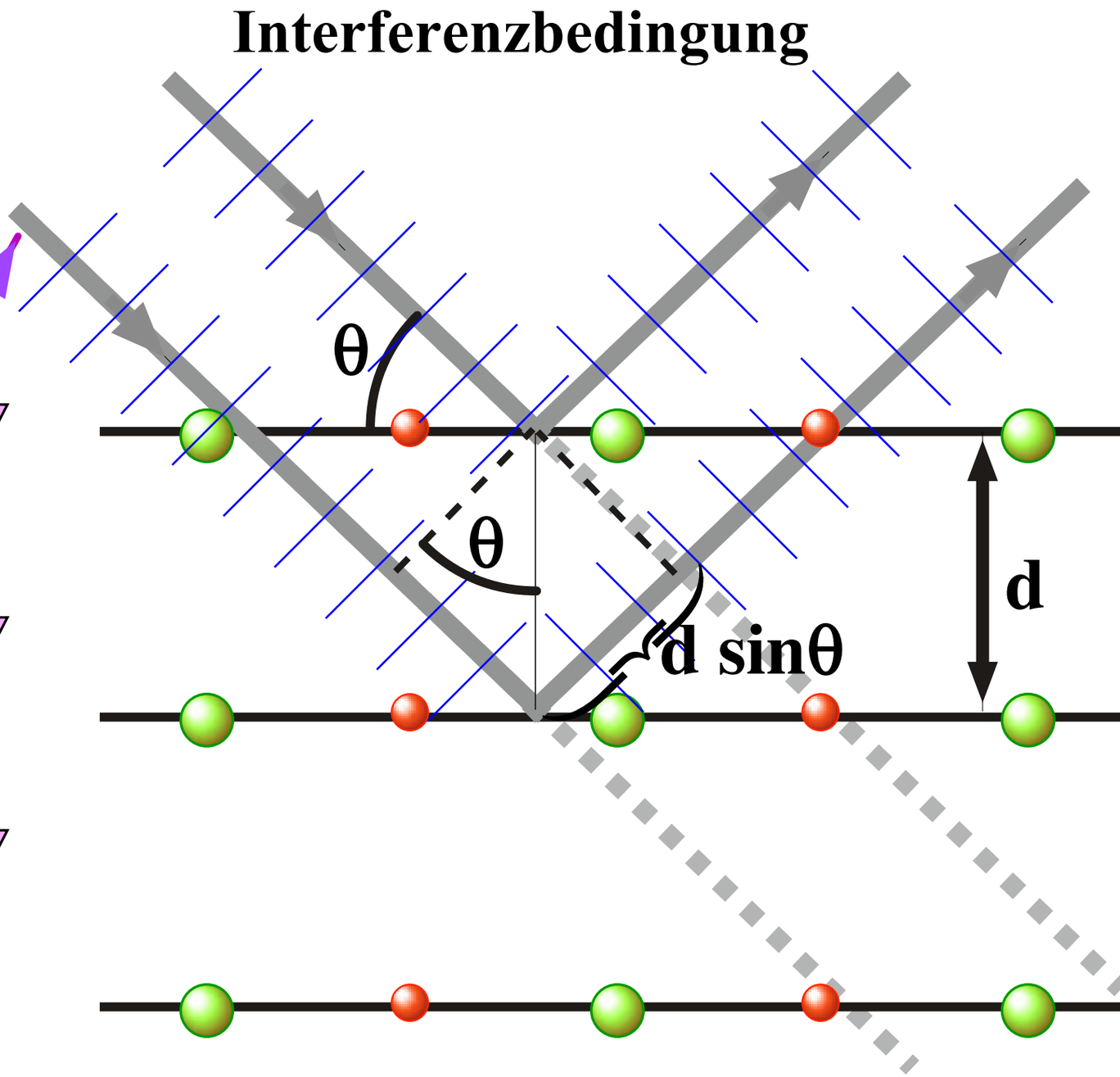
Reflexion



Reflexionskoeffizient <<< 1 !

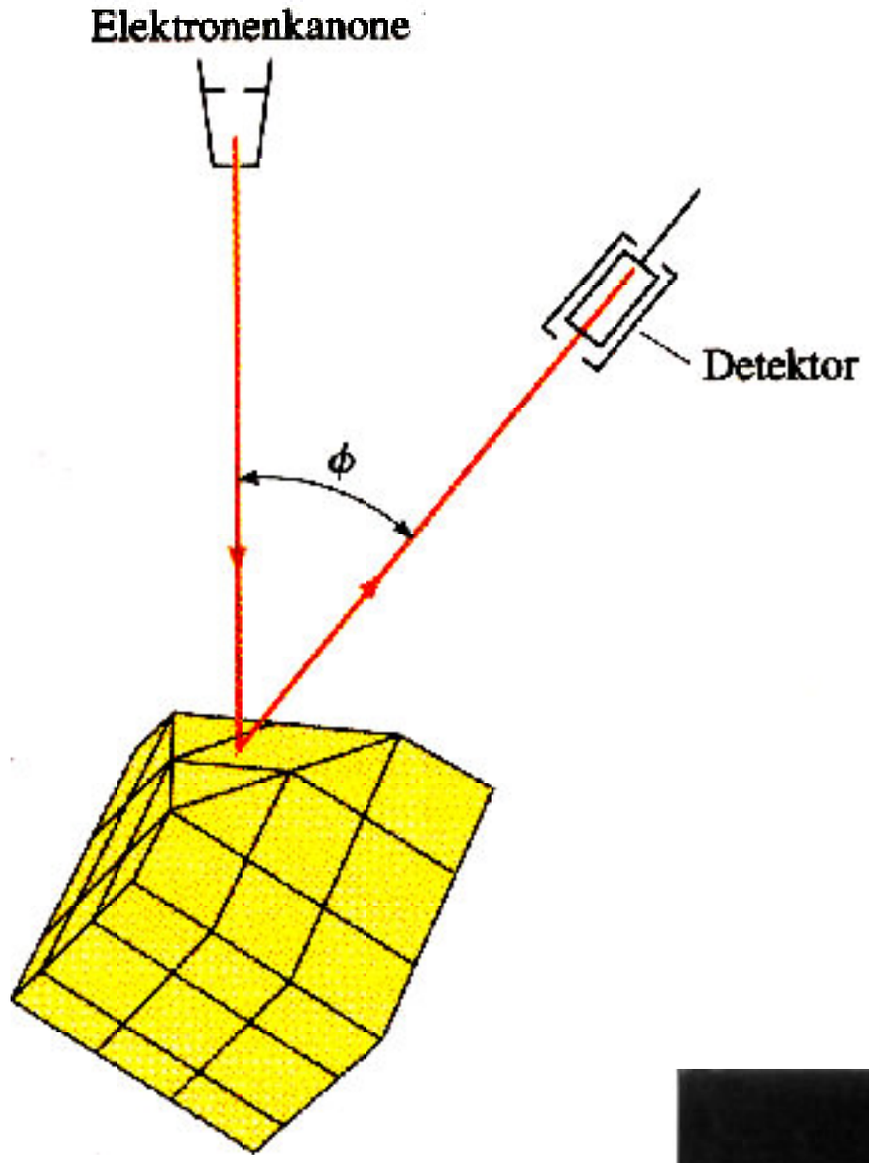
Bragg - Bedingung

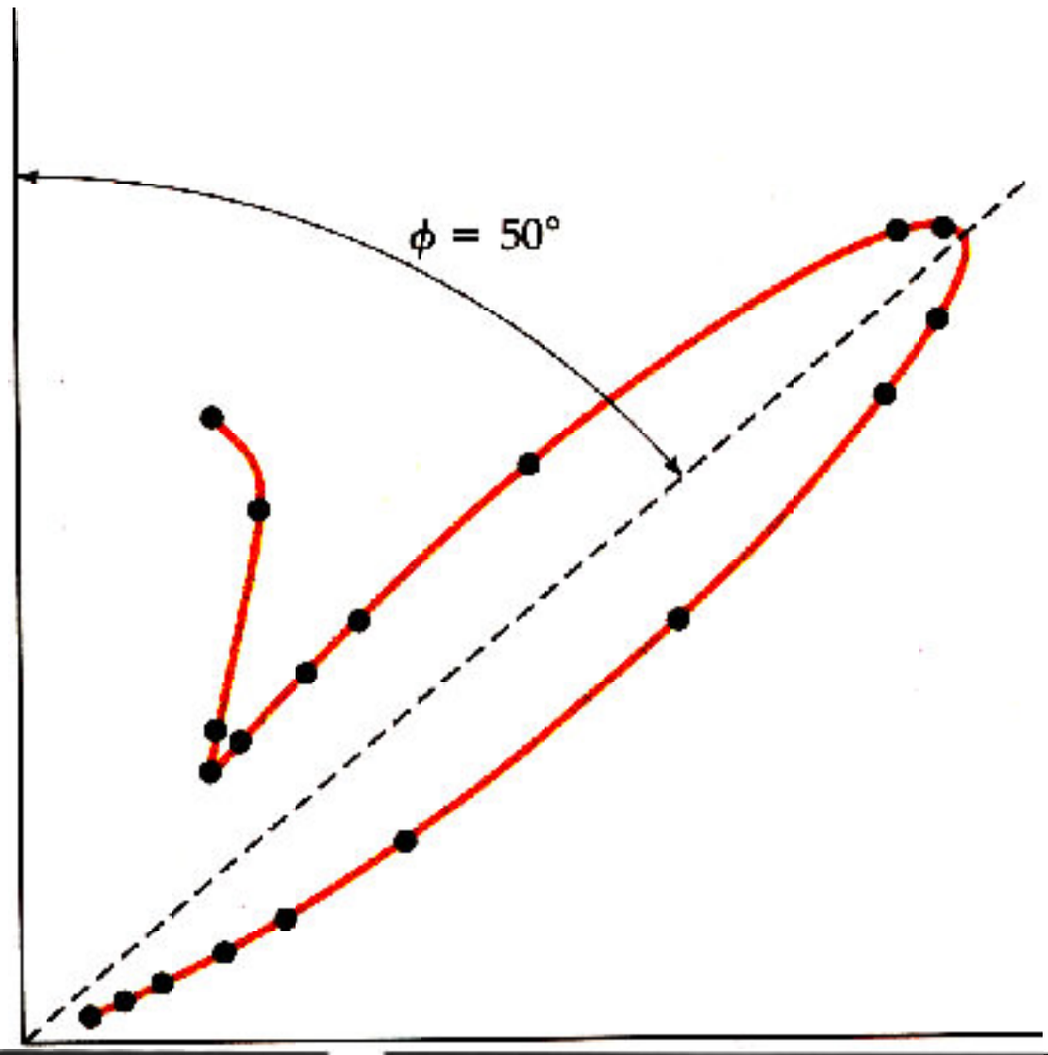




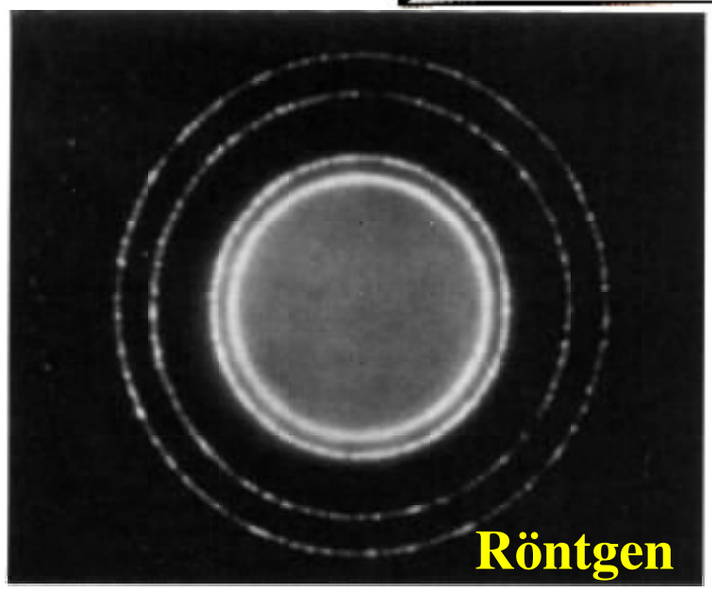
Positive Interferenz durch Überlagerung der Einzelstrahlen

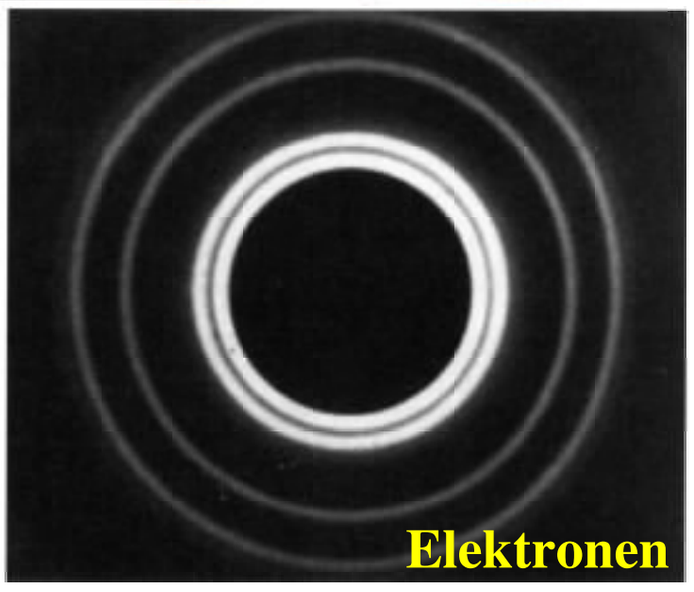
Elektronenbeugung



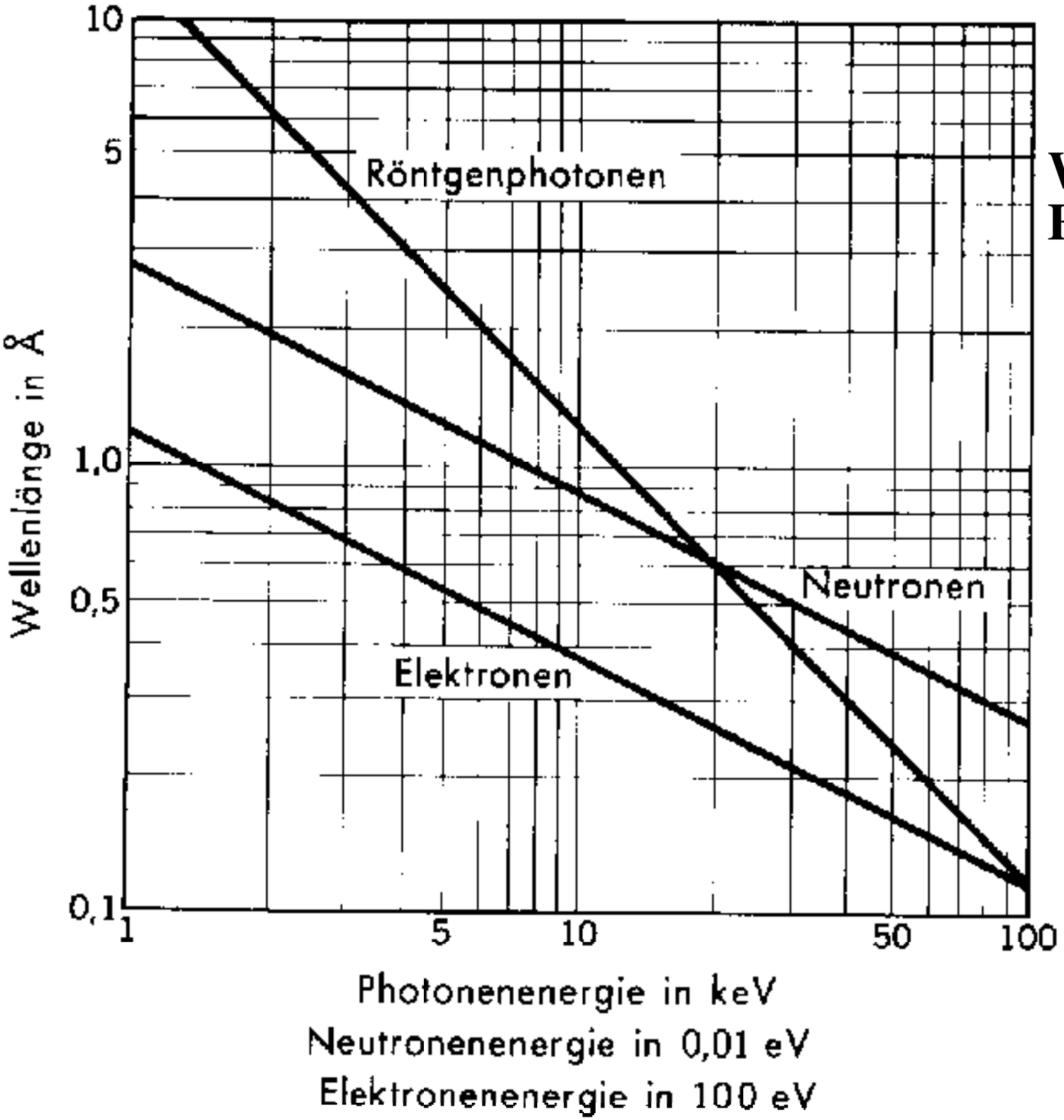


Vergleich der Beugungsmuster von Röntgen und Elektronenstrahlen





Wellenlängen



Wellenlängen für Photonen, Elektronen, Neutronen

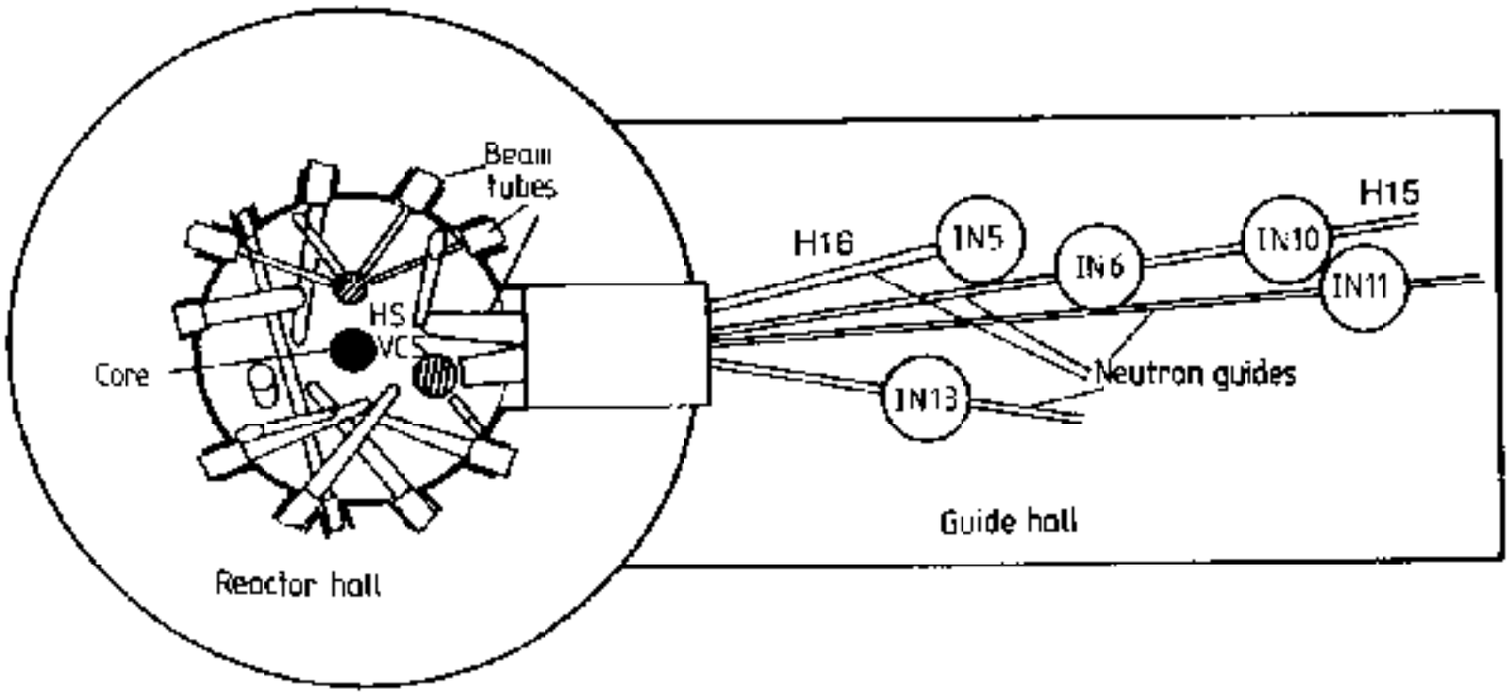
$$\lambda_R\,(\text{Å}) = \frac{12.4}{E(\text{keV})}$$

$$\lambda_e\,(\text{Å}) = \frac{12}{\sqrt{E(\text{eV})}}$$

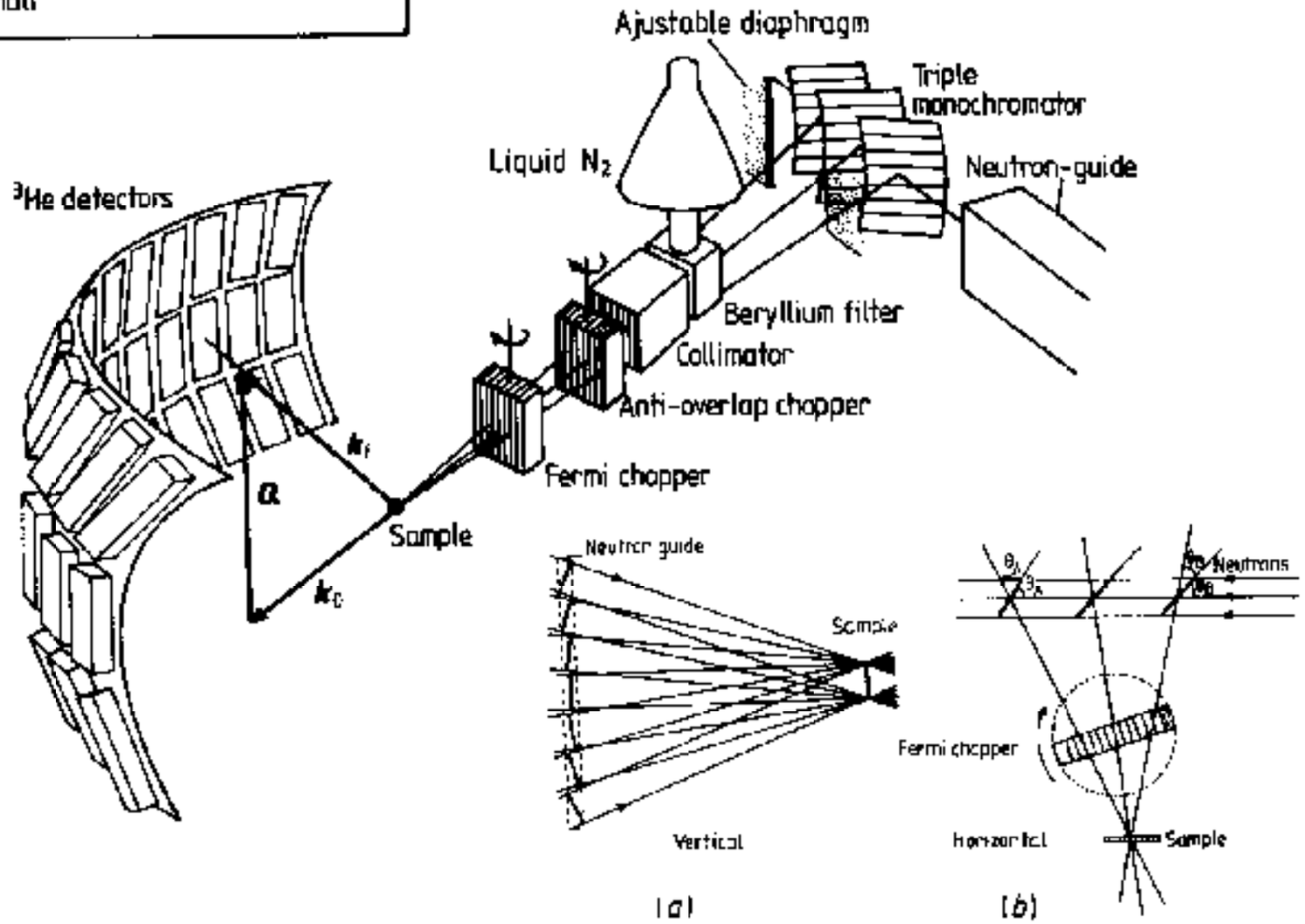
$$\lambda_N\,(\text{Å}) = \frac{0.28}{\sqrt{E(\text{eV})}}$$

Neutronenbeugung

Reaktor als Neutronenquelle (ILL Grenoble)

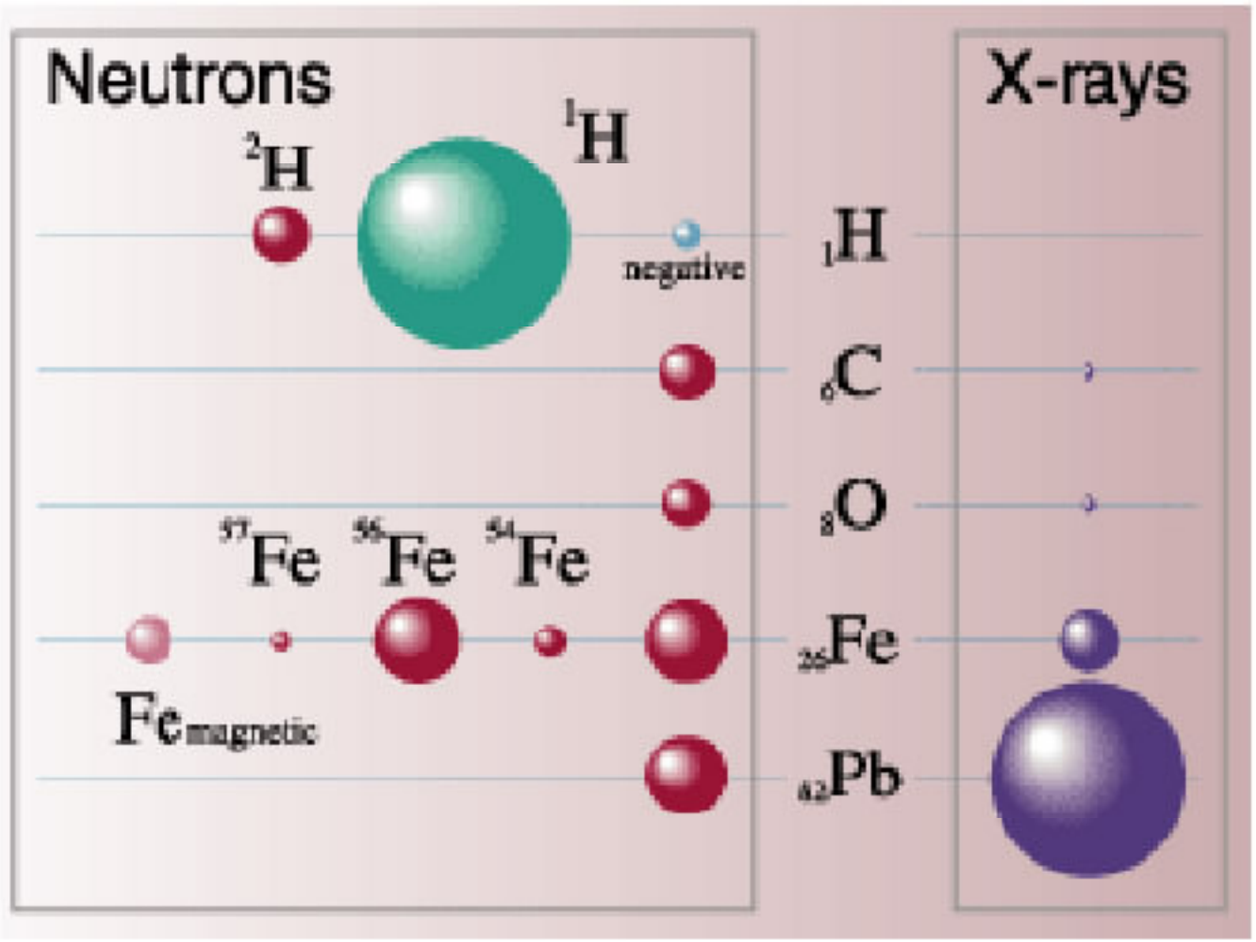


IN6 Flugzeitspektrometer



Neutronenbeugung

Streuquerschnitte



Spallationsquelle