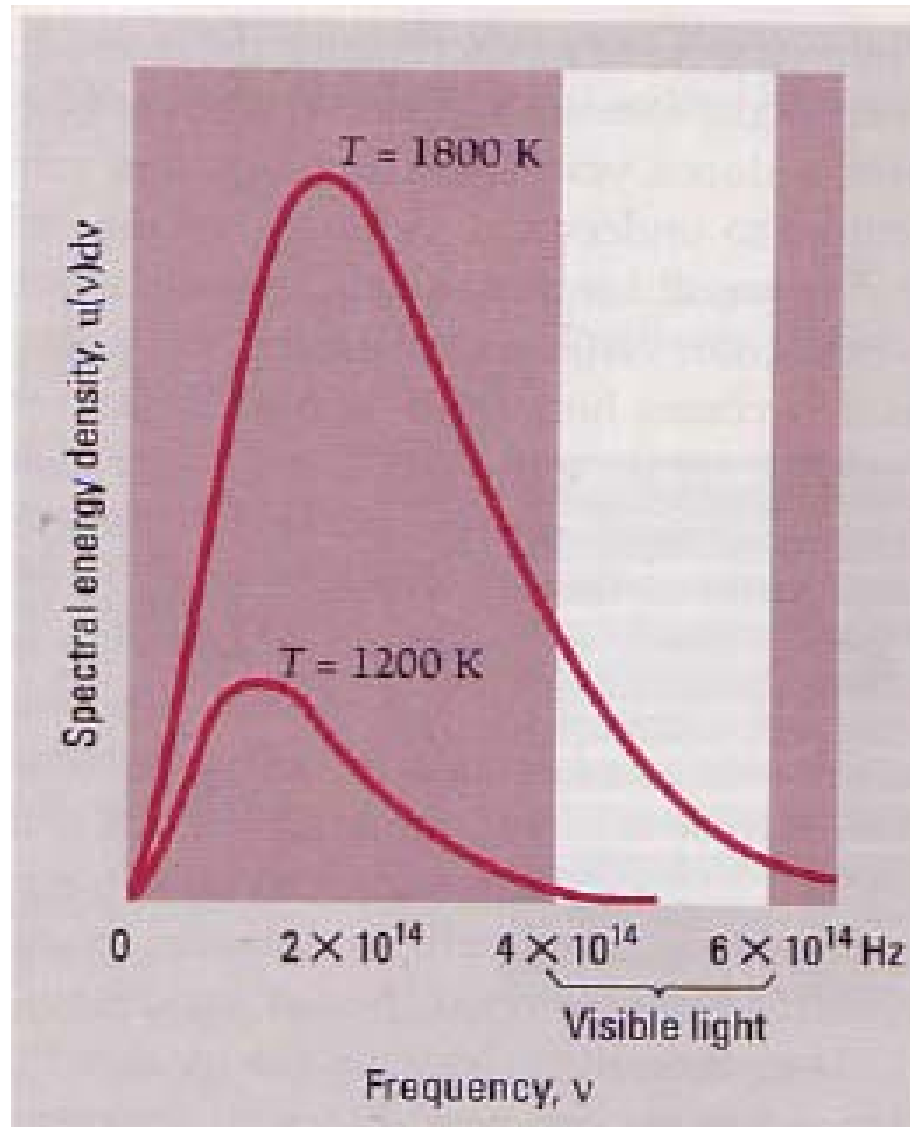
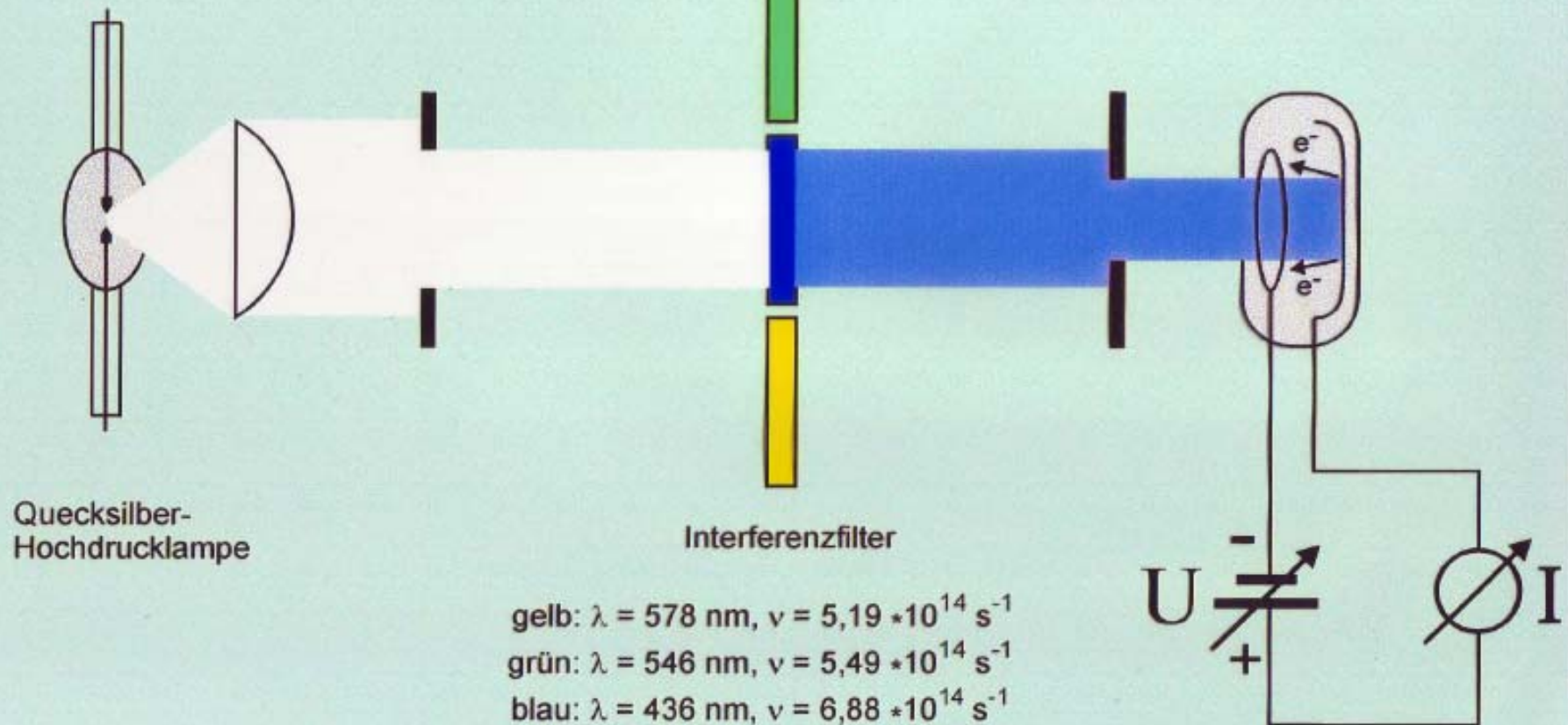


Spektrale Energieverteilung der Schwarzkörperstrahlung

Planck'sches Strahlungsgesetz

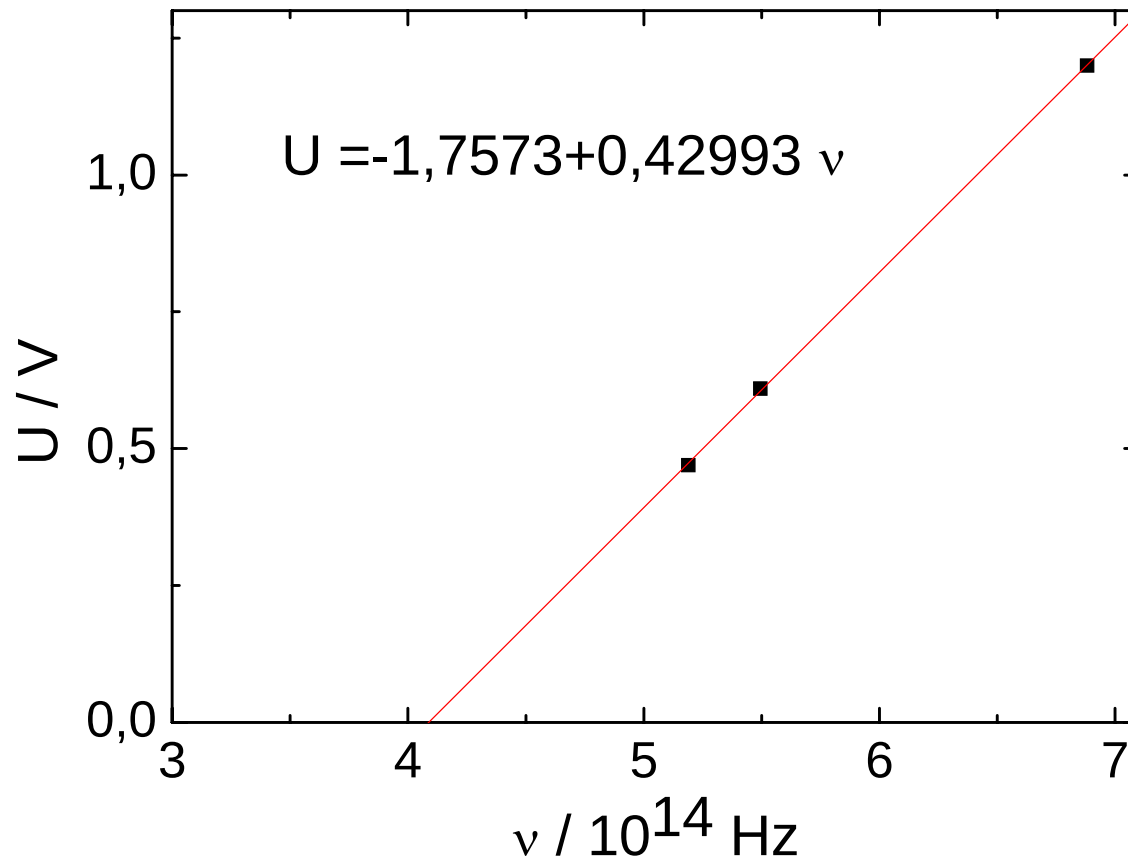


Versuchsaufbau zum Photoeffekt



Versuchsdurchführung zum Photoeffekt

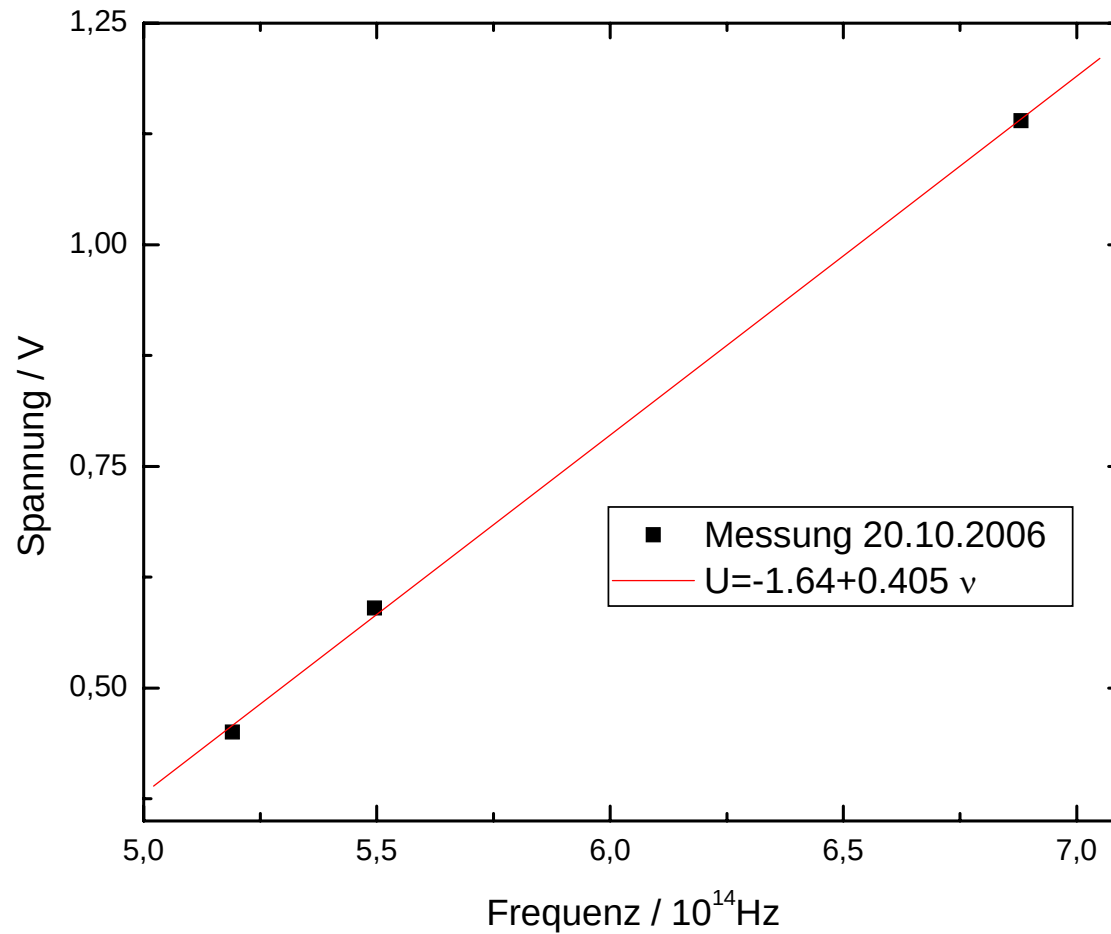
(27.4.2005)



Farbe	λ/nm	$f / 10^{14} \text{ Hz}$	U / V
gelb	578	5,19031	0,47
grün	546	5,49451	0,61
blau	436	6,88073	1,2

Planck'sches Wirkungsquantum
 $h = e \cdot 0.429/10^{14}$
 $= 6.86 \times 10^{-34} \text{ Js}$

Versuchsdurchführung zum Photoeffekt (20.10.2006)



Farbe	λ /nm	$f / 10^{14}$ Hz	U / V
gelb	578	5,19031	0,45
grün	546	5,49451	0,59
blau	436	6,88073	1,14

Planck'sches Wirkungsquantum
 $h = e \cdot 0.405 / 10^{14}$
 $= 6.49 \times 10^{-34} \text{ Js}$

Anwendung des Photoeffekts

Sekundärelektronenvervielfacher (Multiplikator)

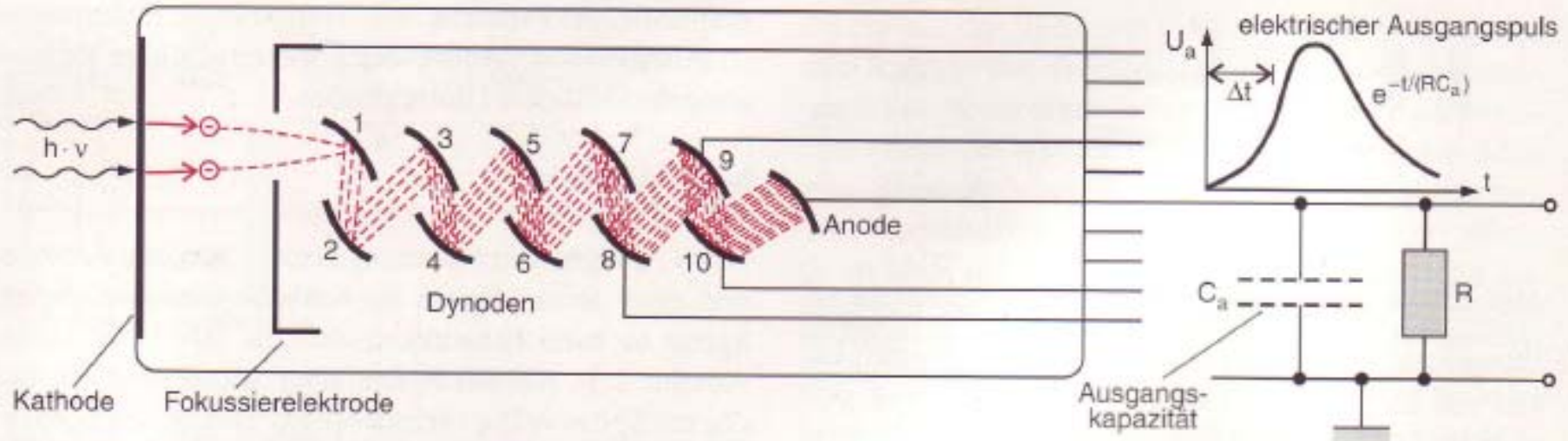
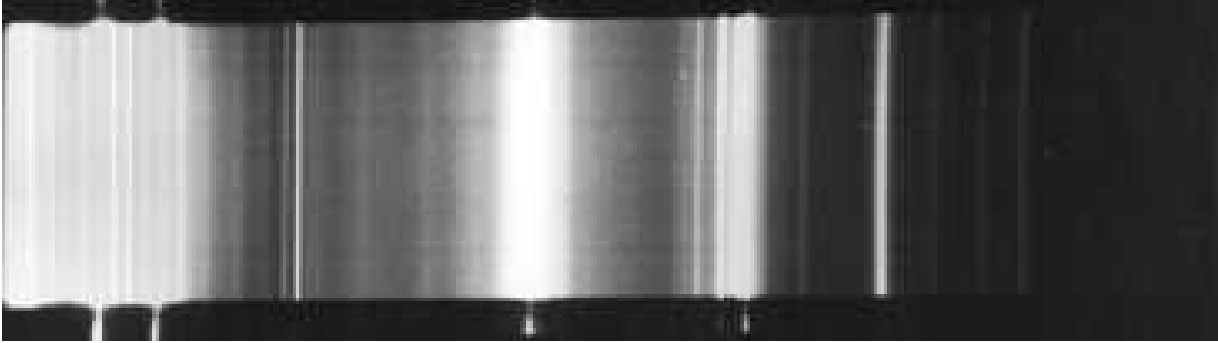


Abb. 2.38. Prinzip des Sekundärelektronenvervielfachers (Photomultiplier). Die Anstiegszeit Δt des Ausgangspulses

pro Photon gibt die Laufzeitverschmierung der Elektronen im Multiplier an. Die Abfallflanke hängt nur von C_a und R ab

Spektrum einer Hg Hochdrucklampe

(<http://users.forthnet.gr/ath/jgal/spectroscope/Hg.html>)

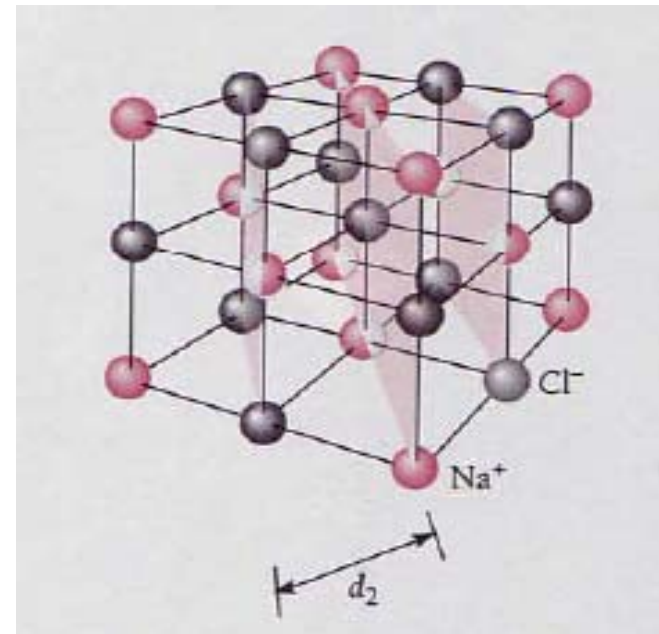
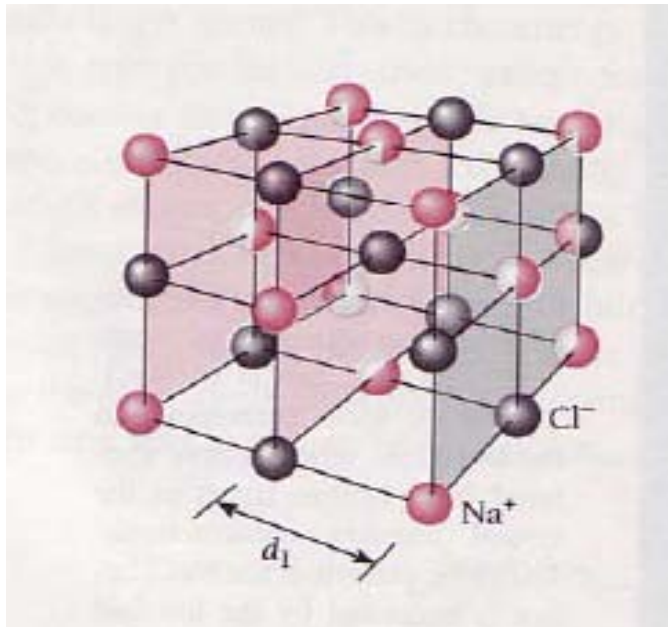


5790.7A
5769.6A

5460.74A

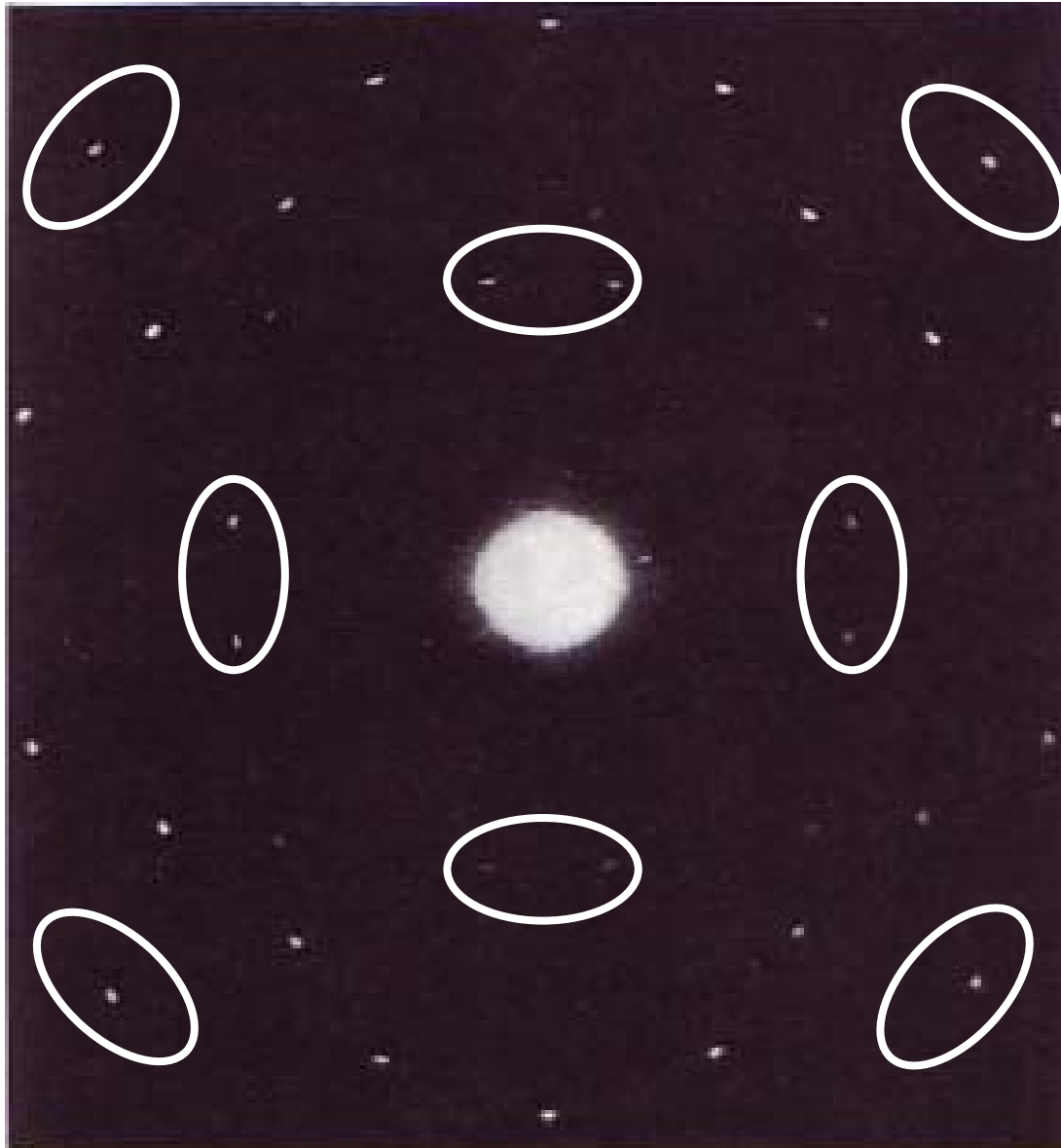
4916.04A

Bragg Ebenen in einem kubischen NaCl Gitter

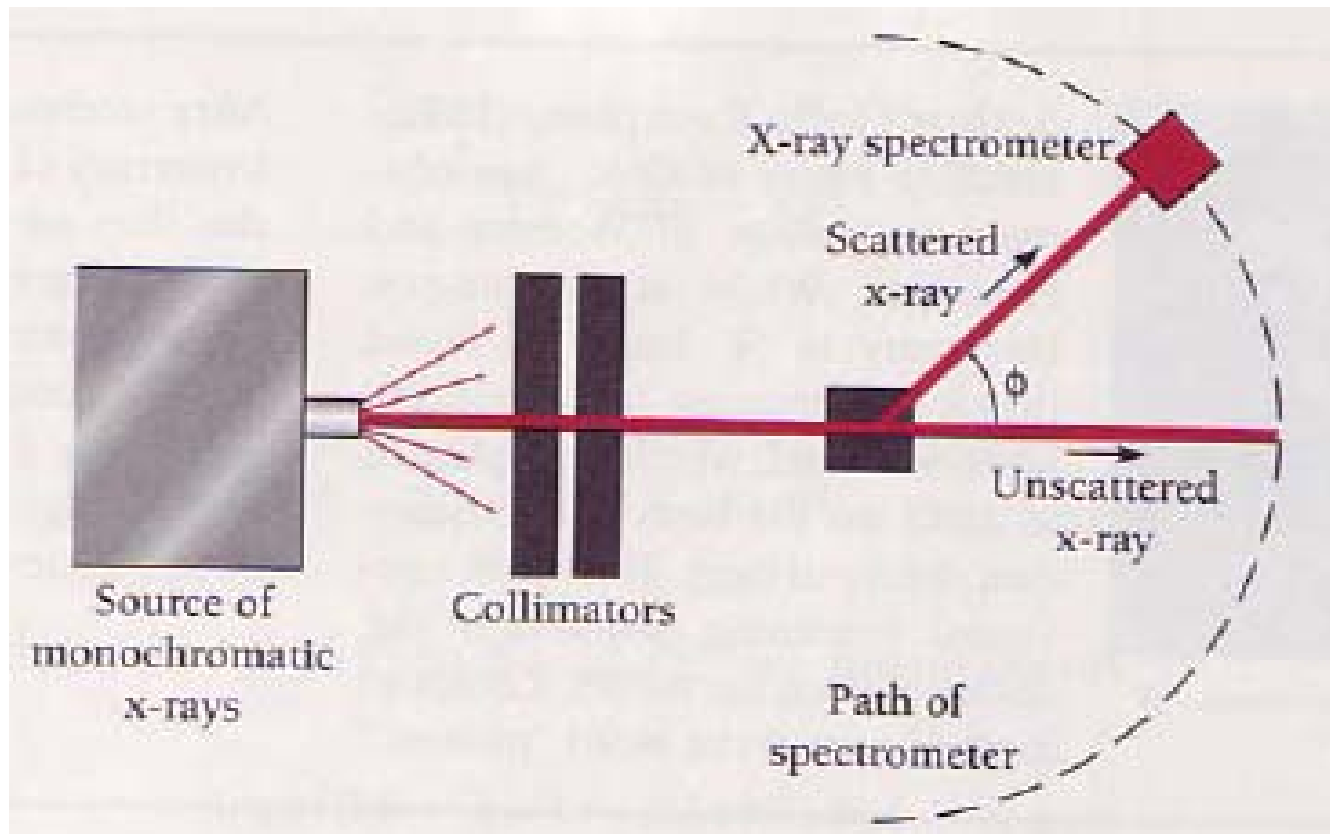


Röntgen Beugungsmuster eines NaCl Gitters

Vierzählige Symmetrie deutet auf kubischen Kristall

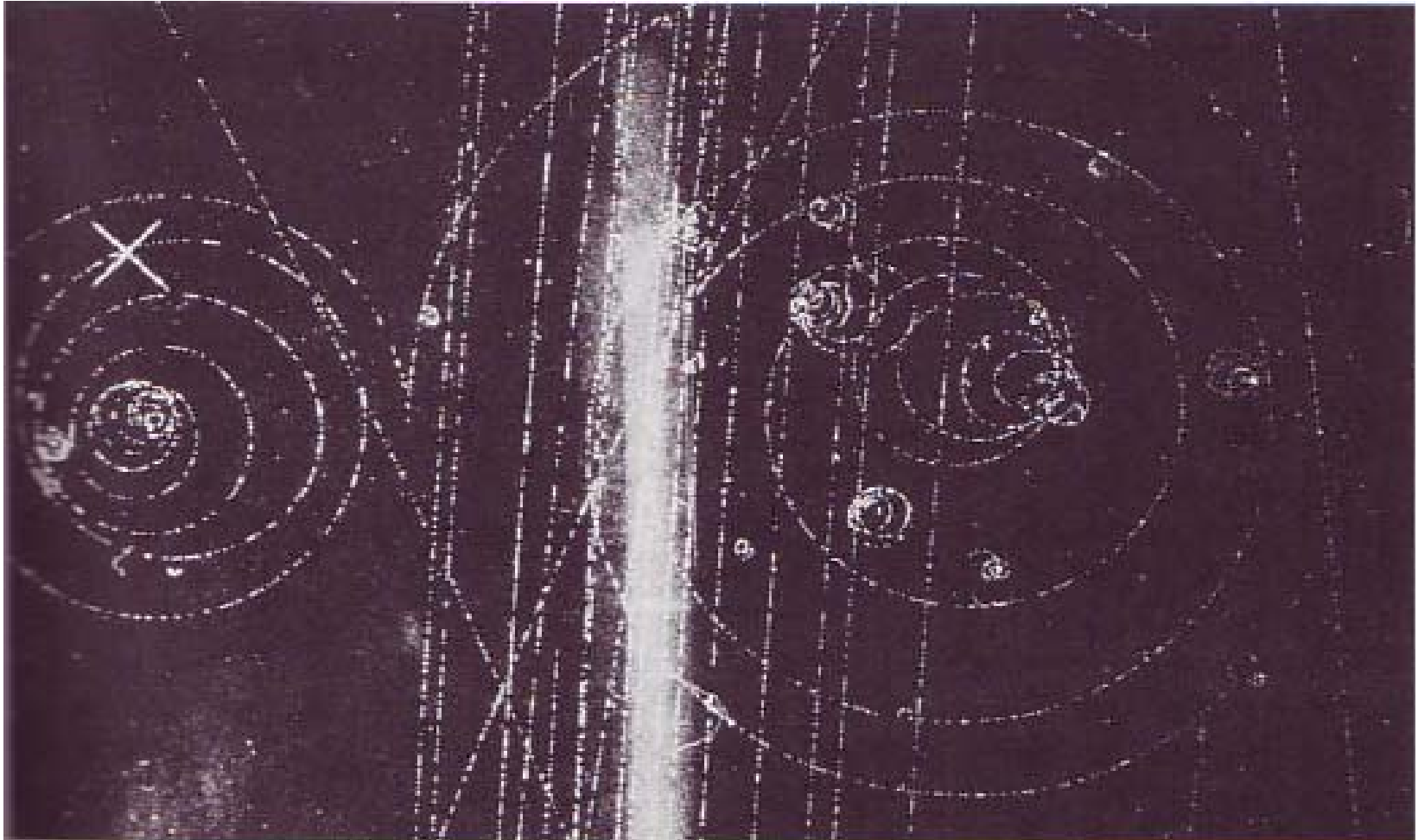


Experiment zur Comptonstreuung

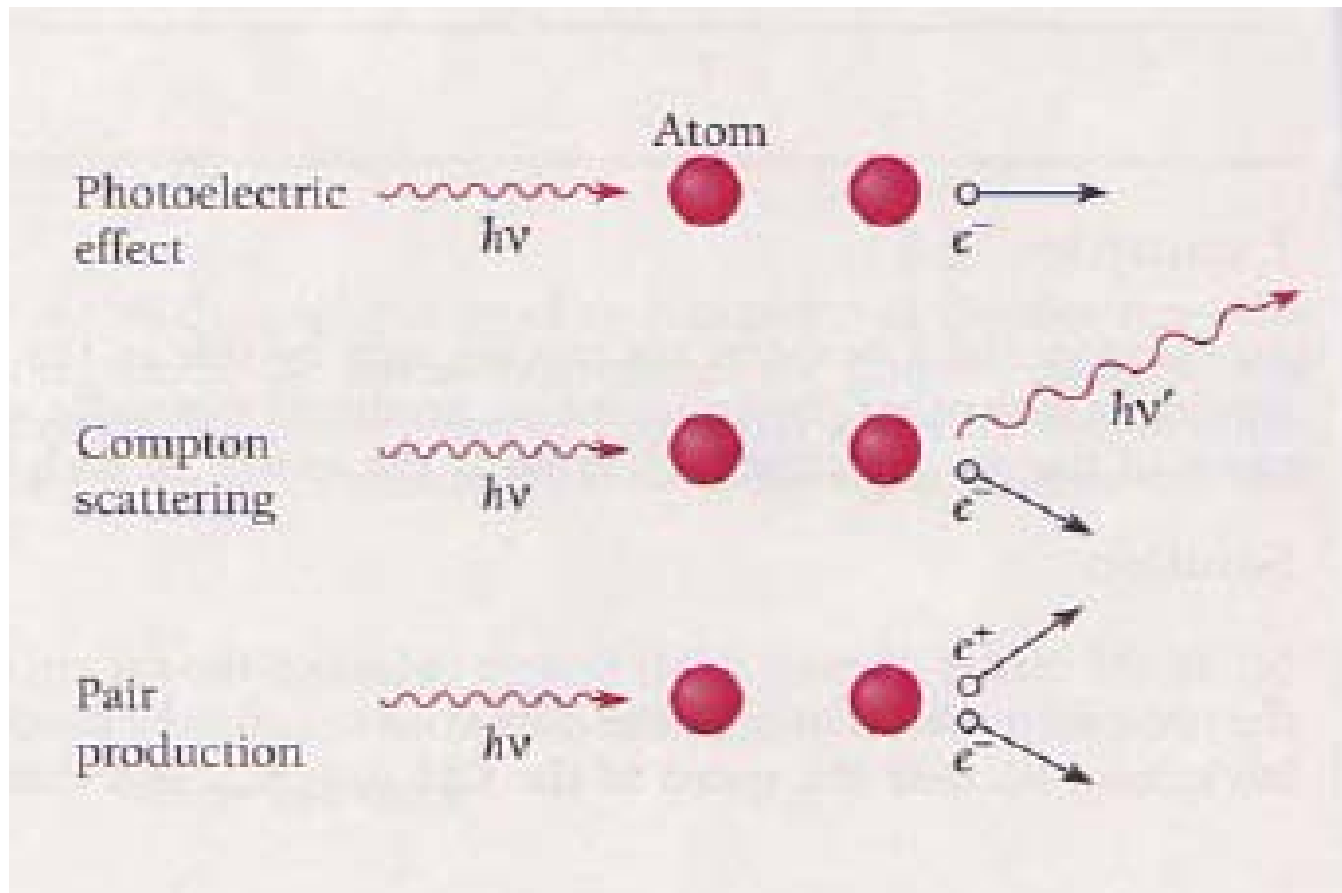


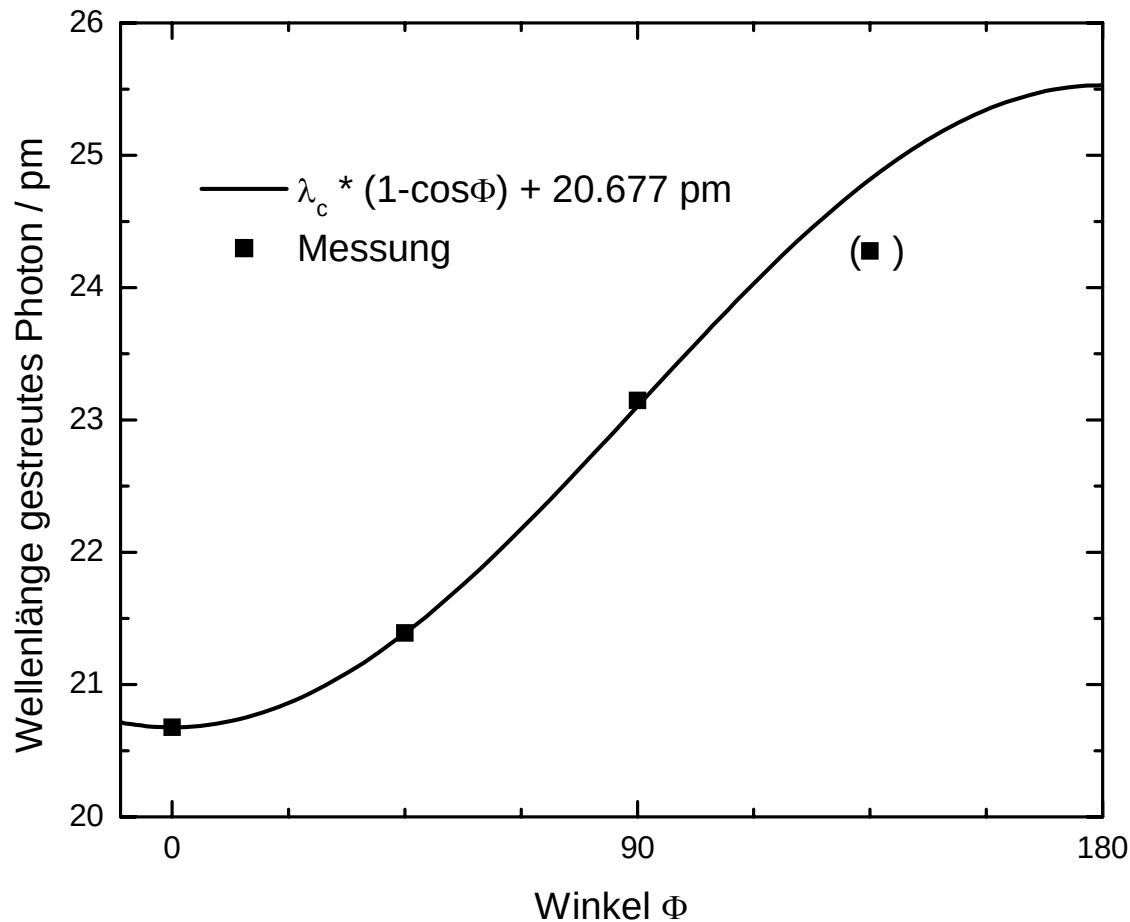
Paarbildung in einer Nebelkammer

Magnetfeld senkrecht zur Bildebene



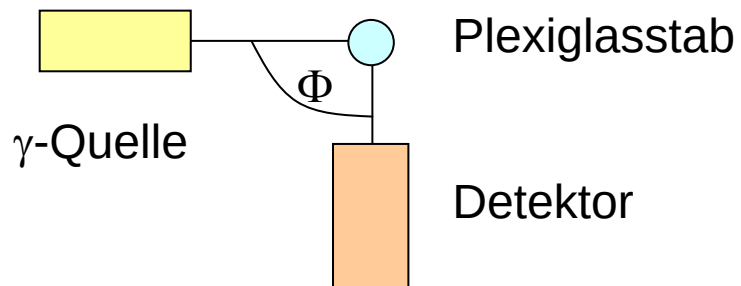
Wechselwirkung von Photonen mit Materie





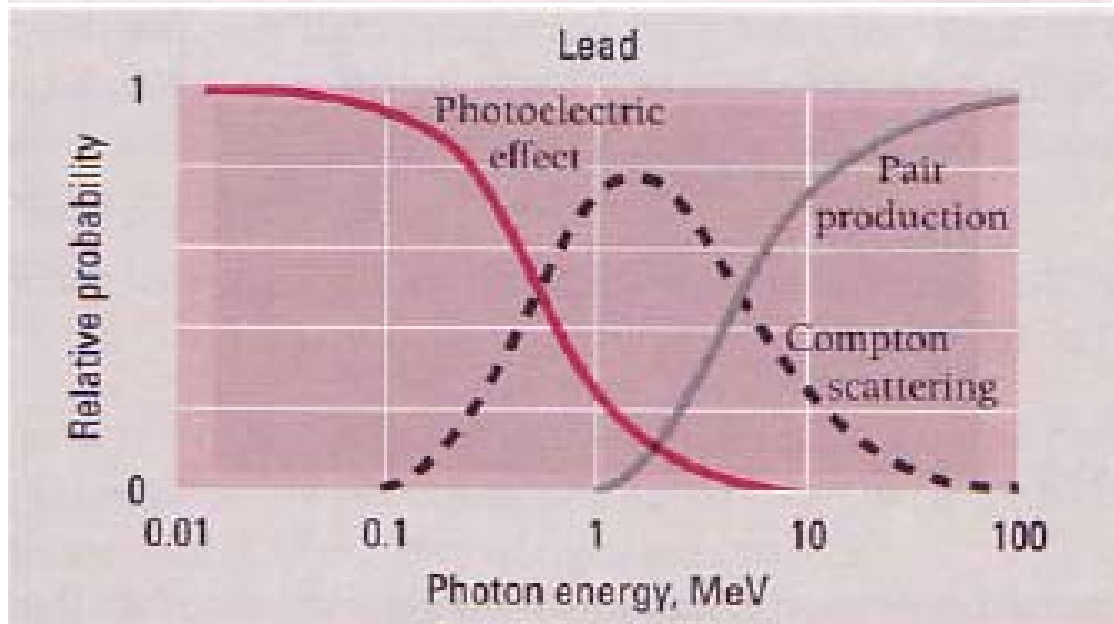
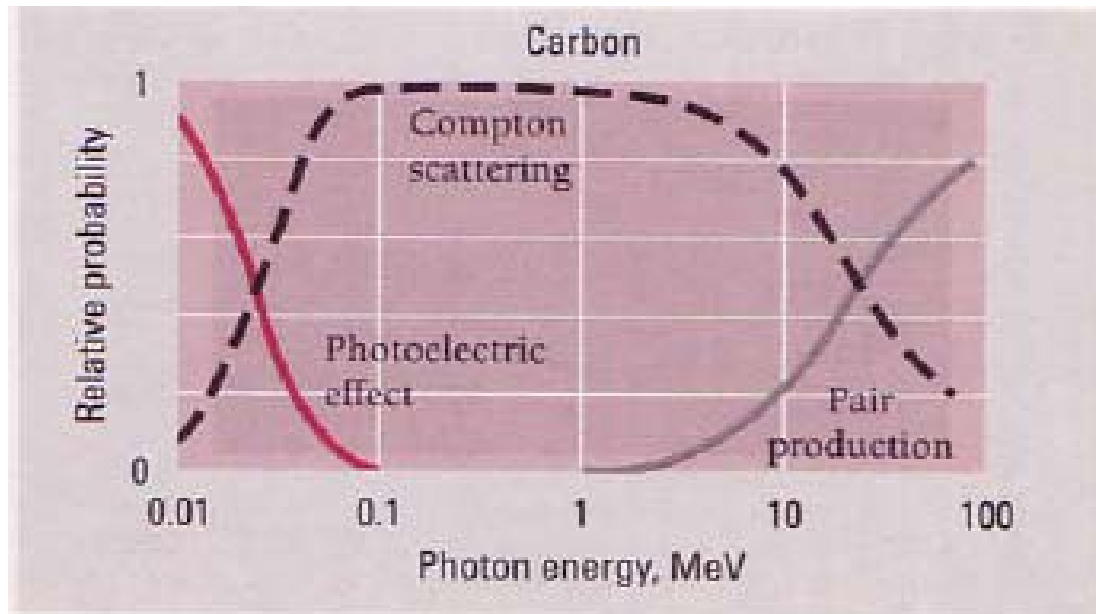
Compton-Effect

Messung vom 27.10.2006



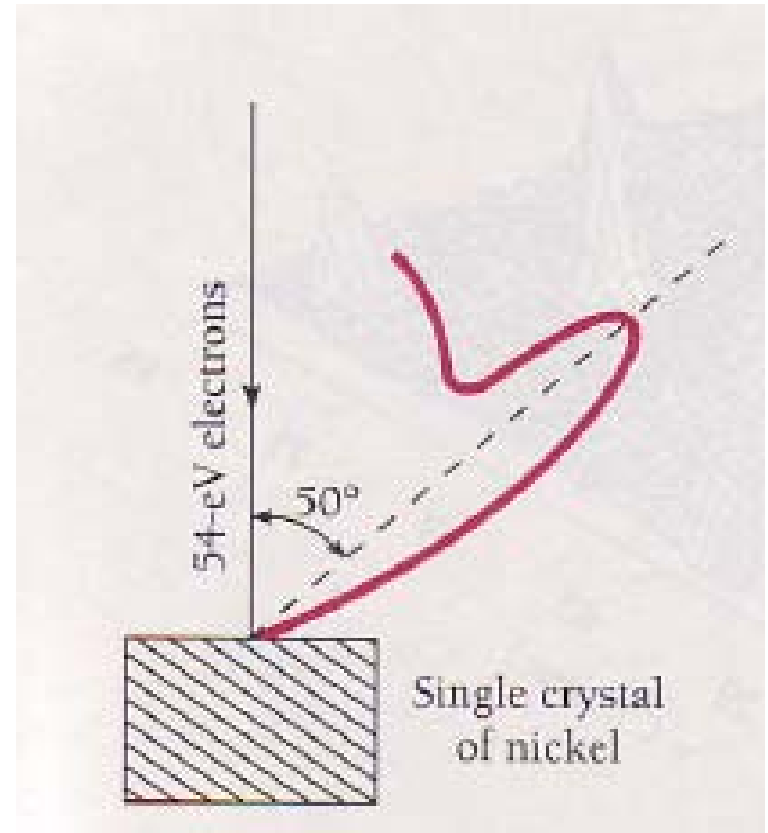
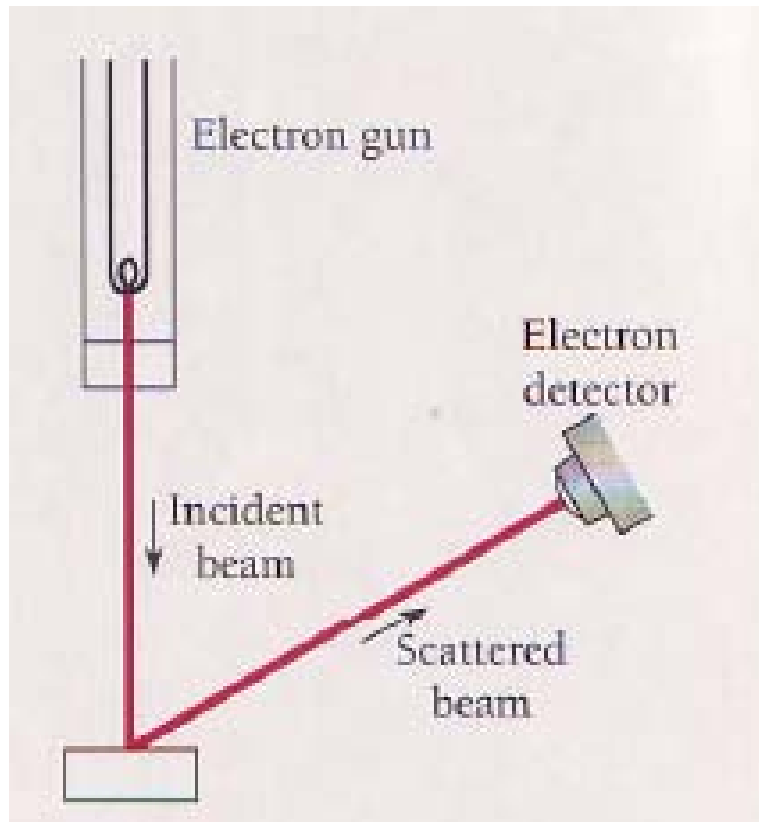
Winkel	Kanal / keV	Wellenlänge/pm
135	51.1	24.2786
90	53.6	23.1462
45	58.0	21.3903
0	60.0	20.6773

Relative Häufigkeit der
behandelten Prozesse



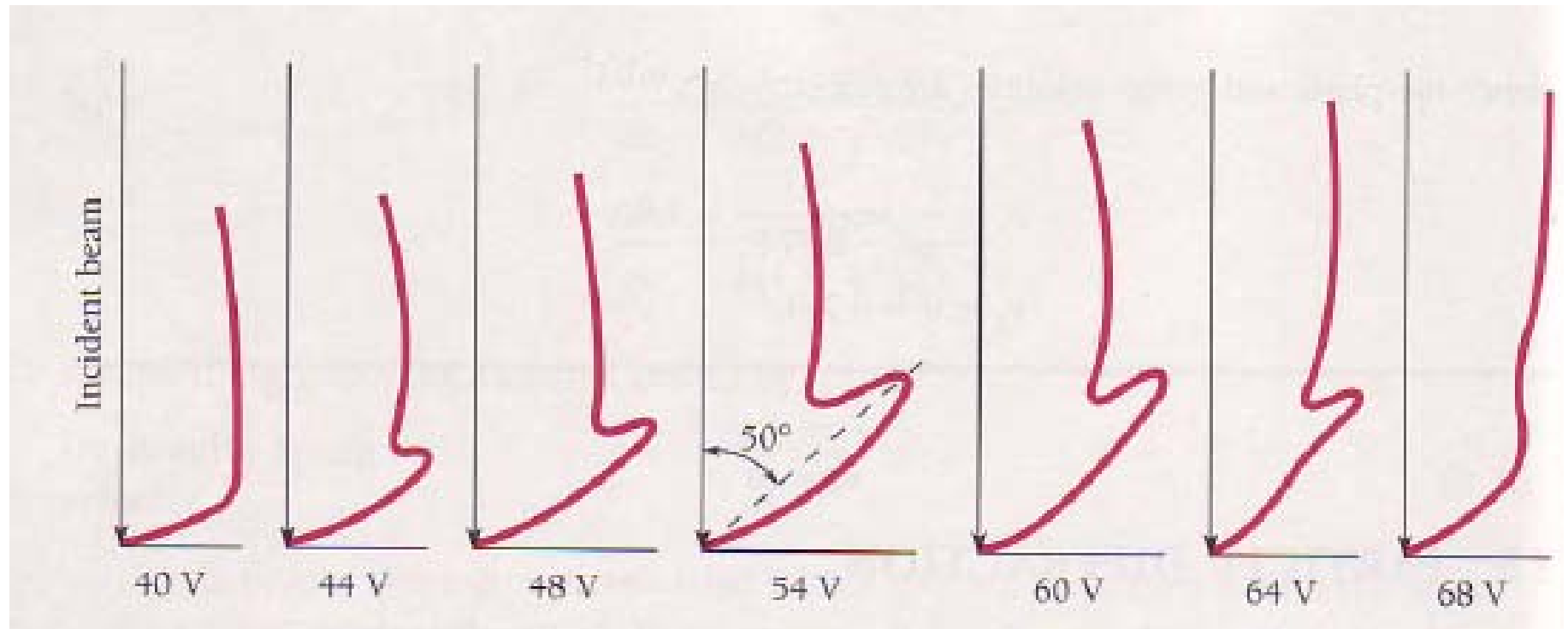
Elektronenbeugung

Davisson and Germer 1927

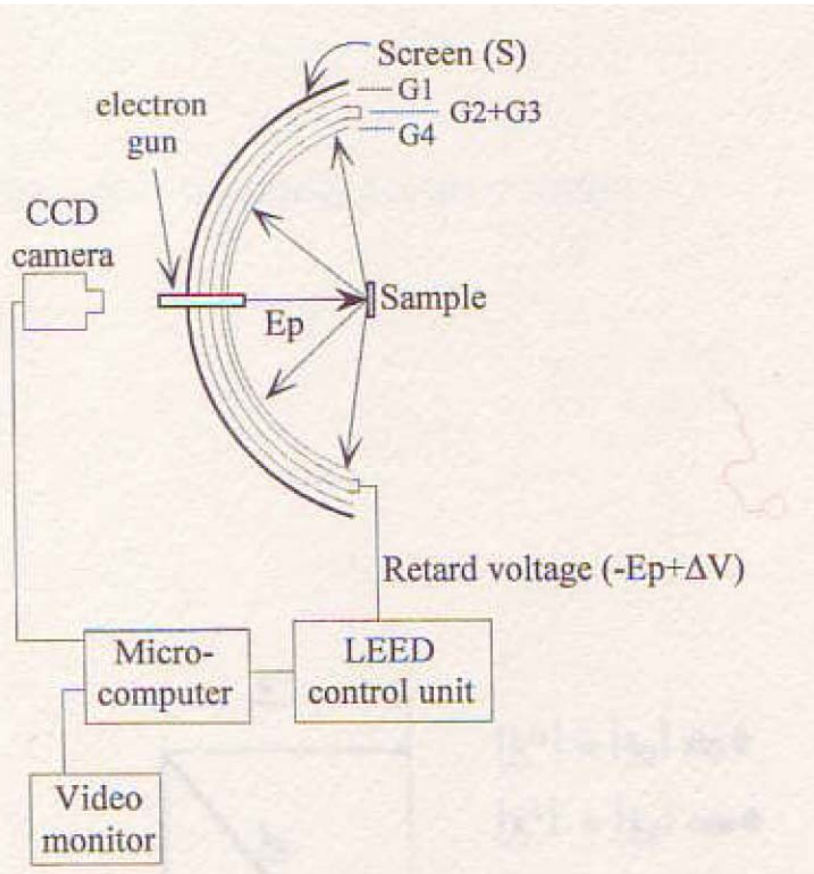


Elektronenbeugung

Davisson and Germer 1927

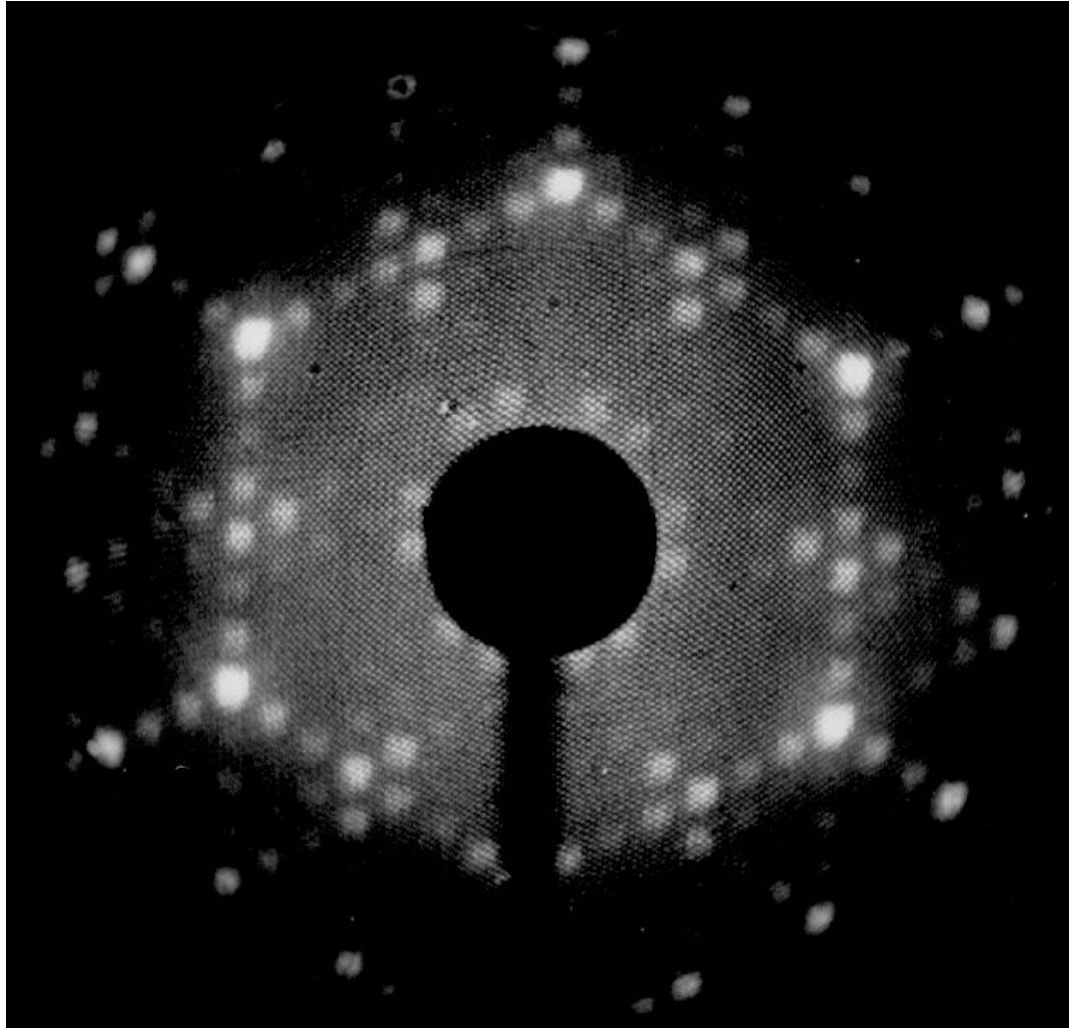


Low Energy Electron Diffraction (LEED)

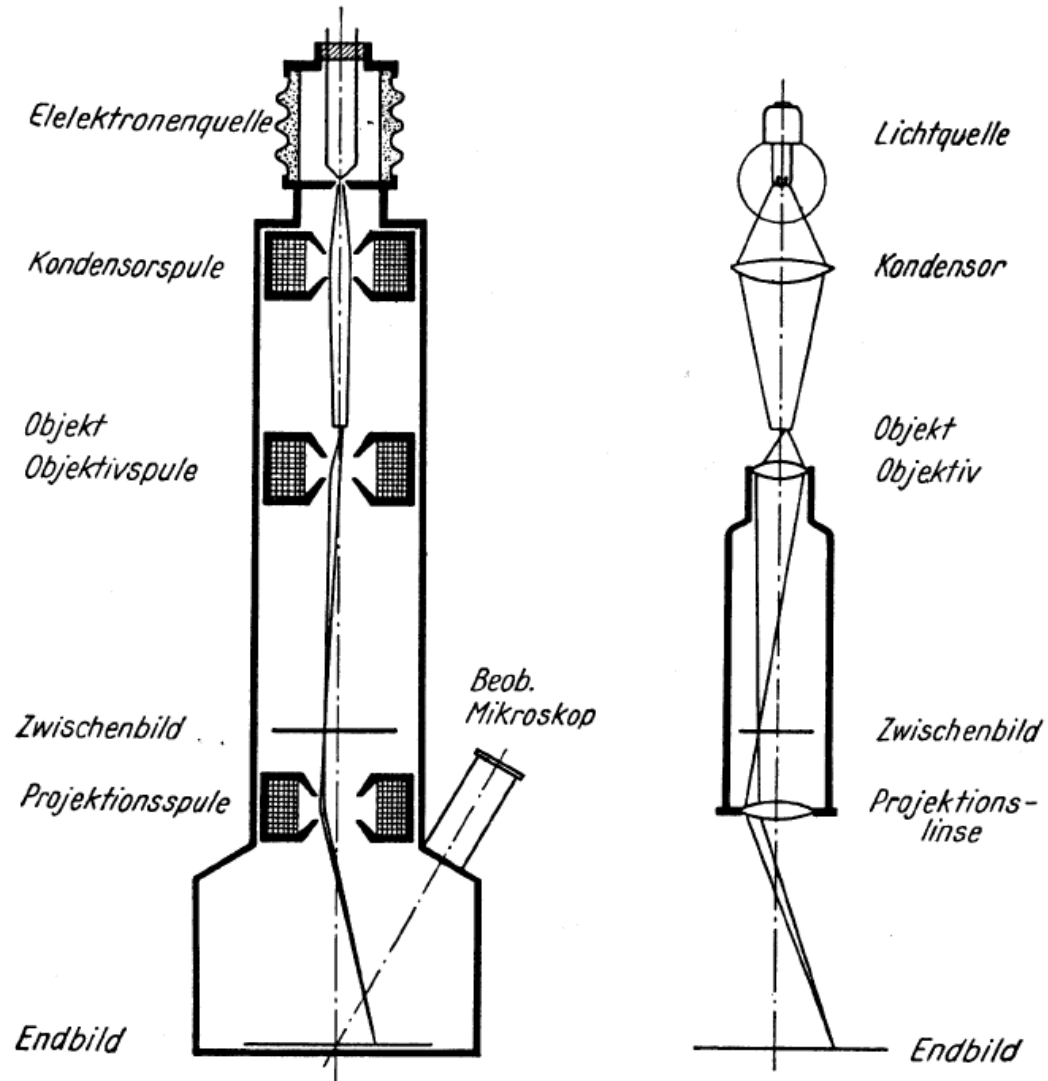


Low Energy Electron Diffraction (LEED)

[Si\(111\) 7×7 LEED pattern](#)



Elektronenmikroskop

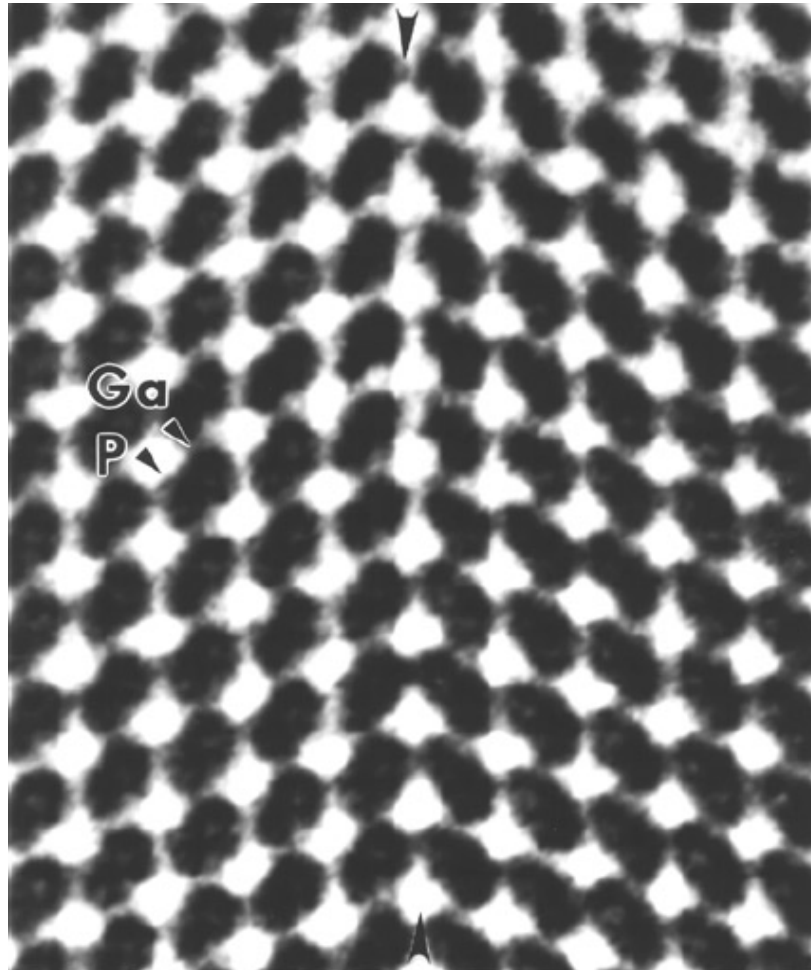


The realization of atomic resolution with the electron microscope

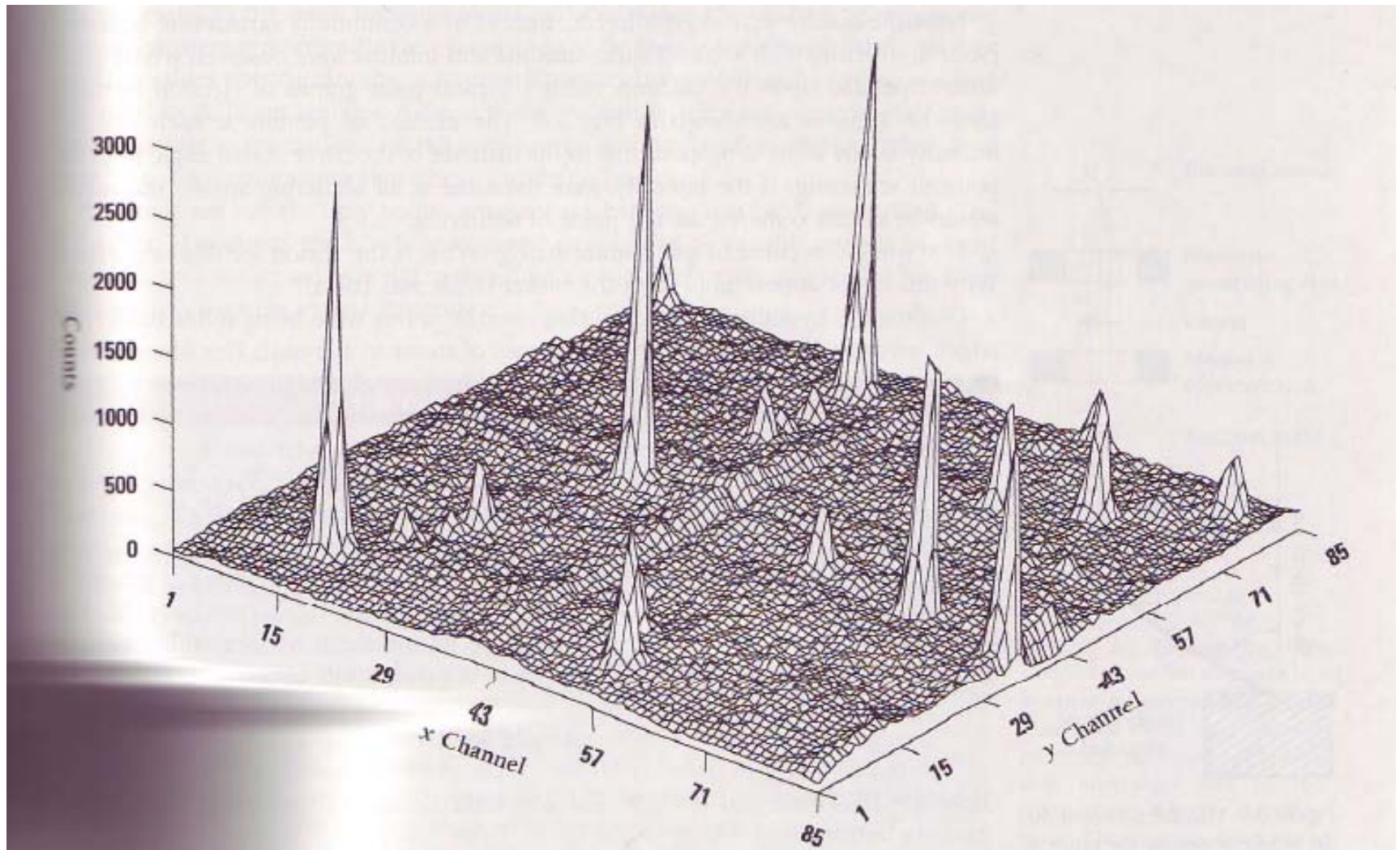
David J Smith†

Institut für Festkörperforschung, Forschungszentrum Jülich, D-52425 Jülich, Germany

Rep. Prog. Phys. 60 (1997) 1513–1580.

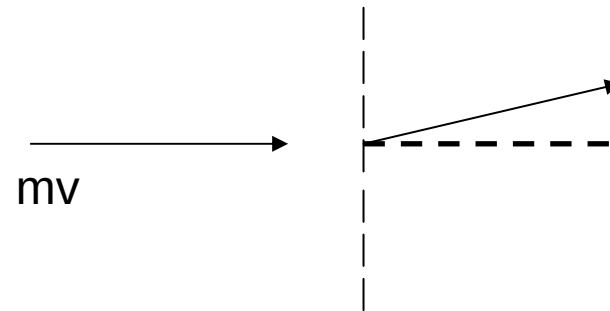
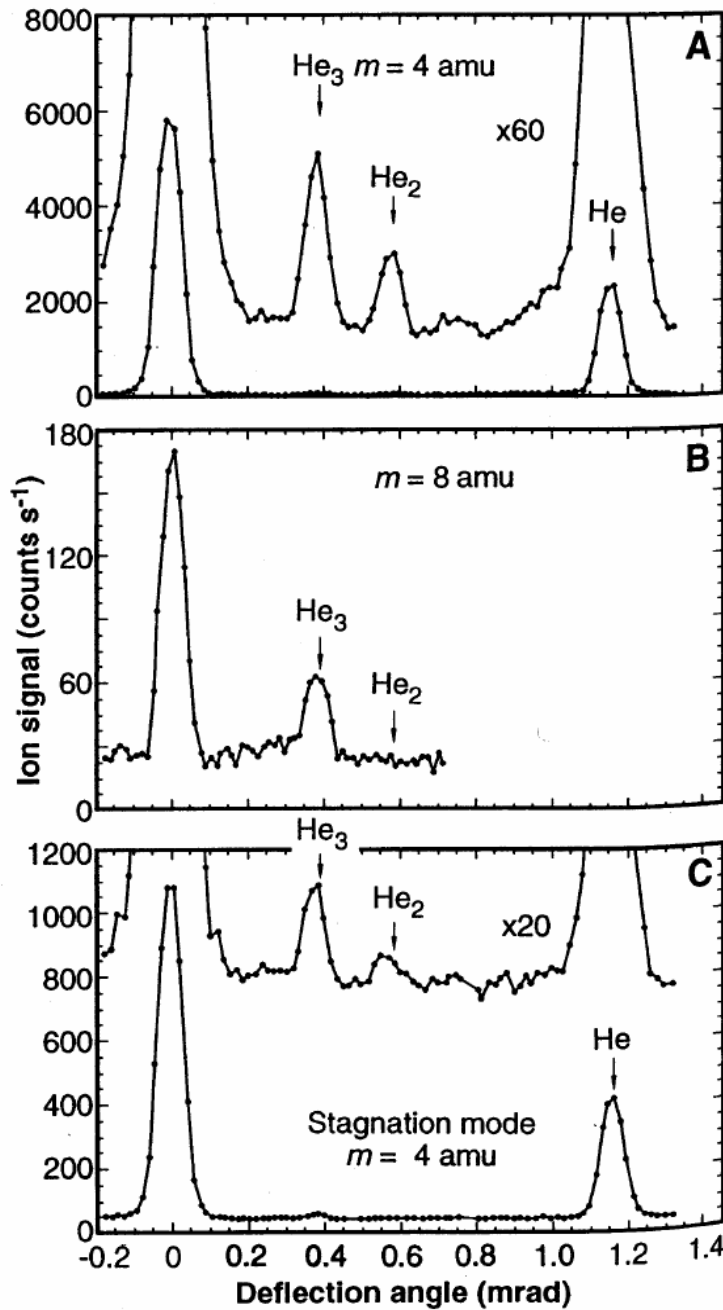


Neutronenbeugung

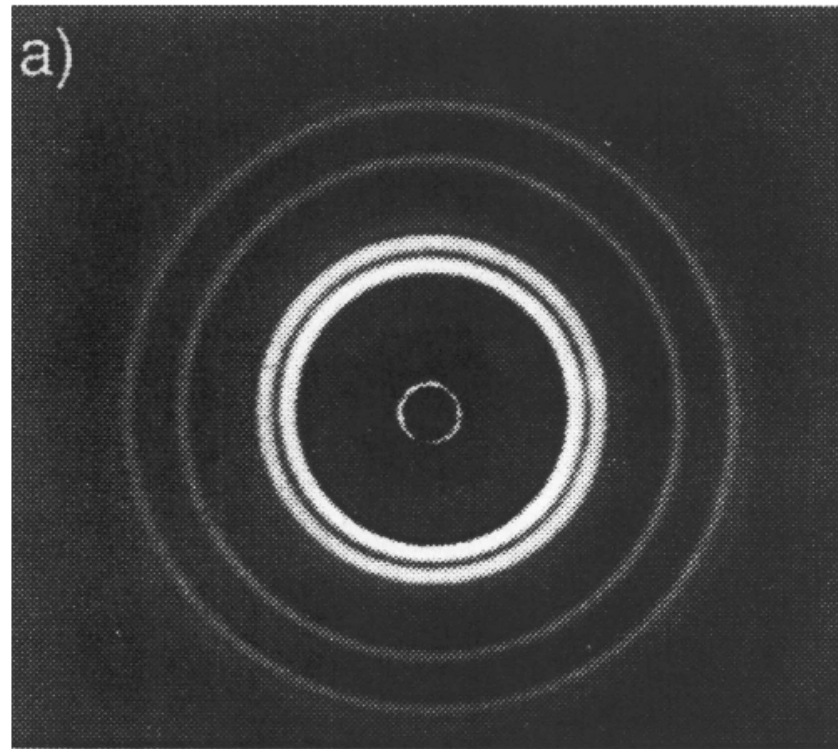


Heliumatomstreuung

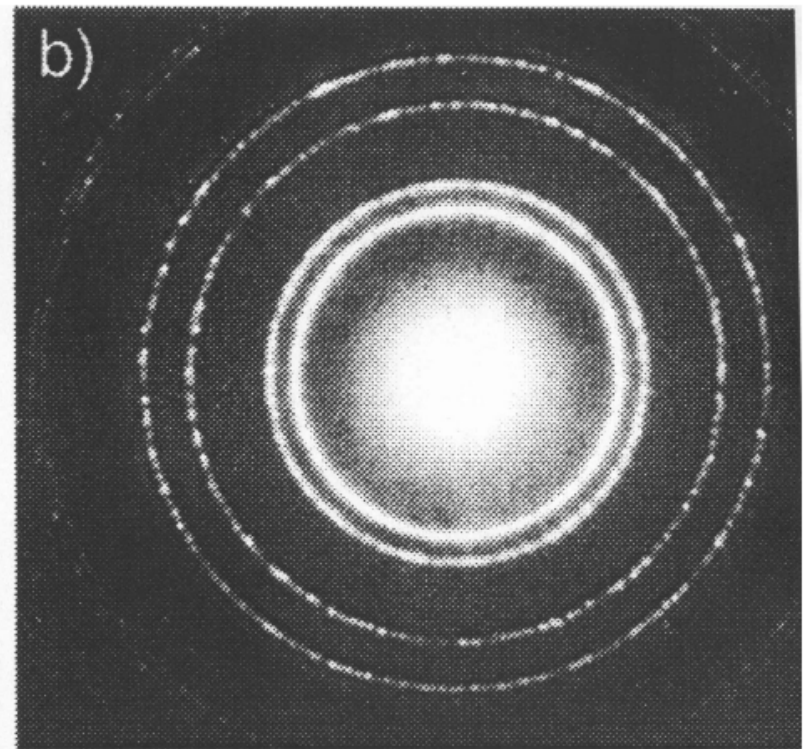
Nachweis der Existenz des He_2



Elektronenbeugung



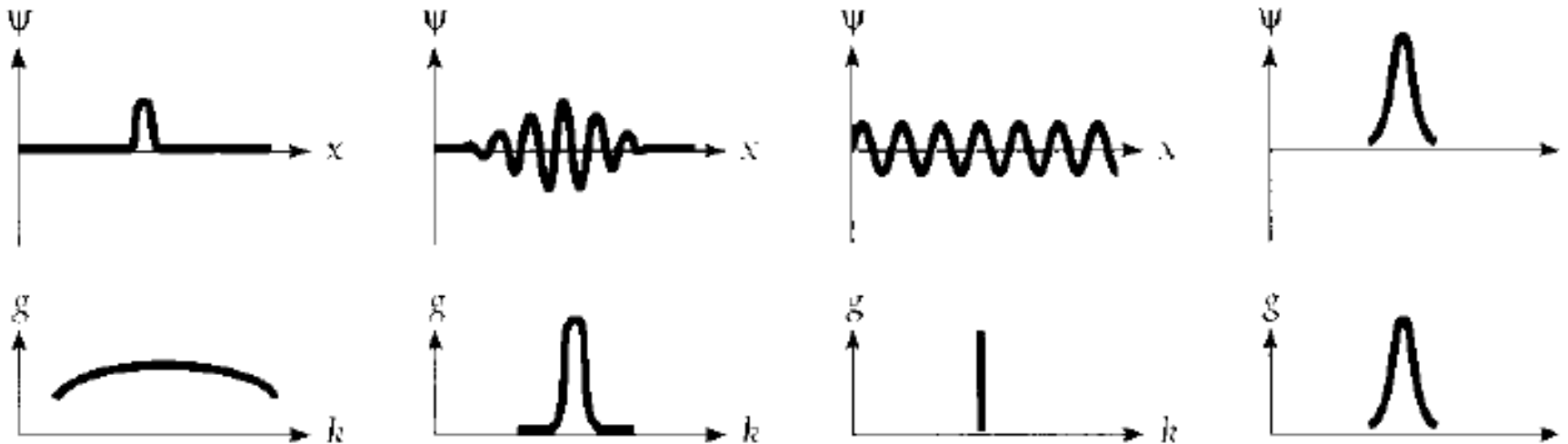
Röntgenbeugung



Heisenberg'sche Unschärfe

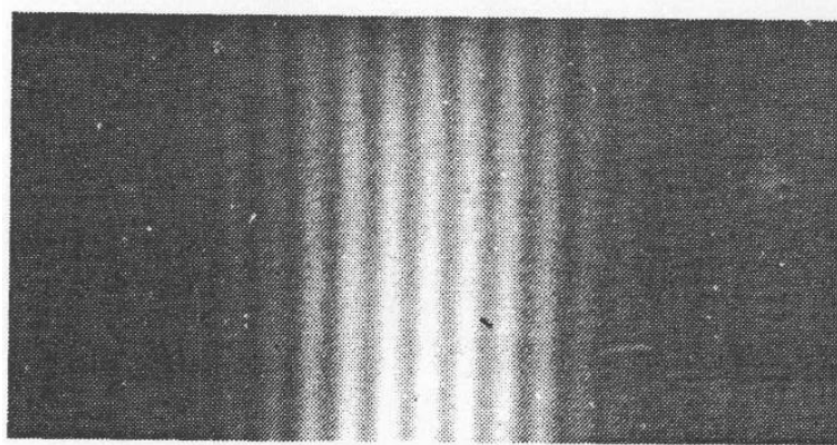
$$\Delta x \Delta k > 1/2$$

Ortsraum

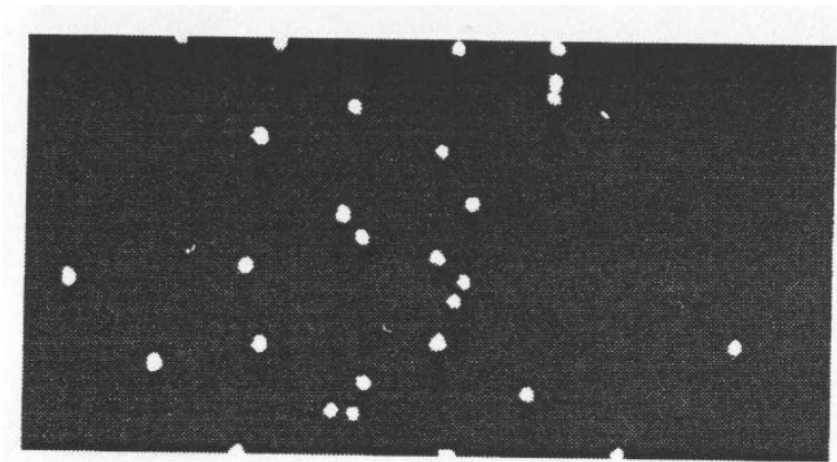


Impulsraum

Beugungsmuster am Doppelspalt



Beugungsmuster am Doppelspalt Lokalisierung von Photonen/Elektronen



Beugungsmuster am Doppelspalt
Lokalisierung von Photonen/Elektronen
Dualismus Welle-Teilchen

