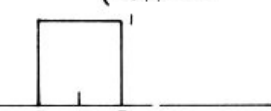
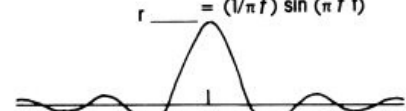
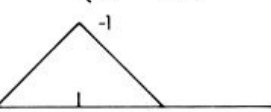
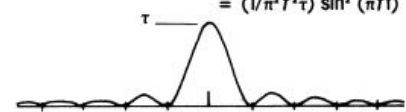
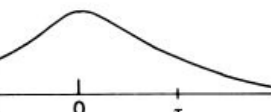
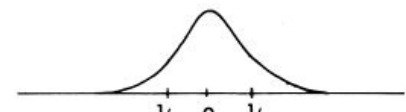


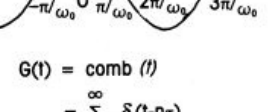
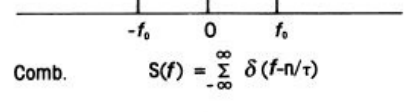
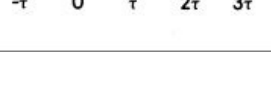
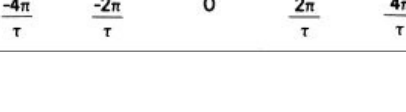


Fourier-Paare

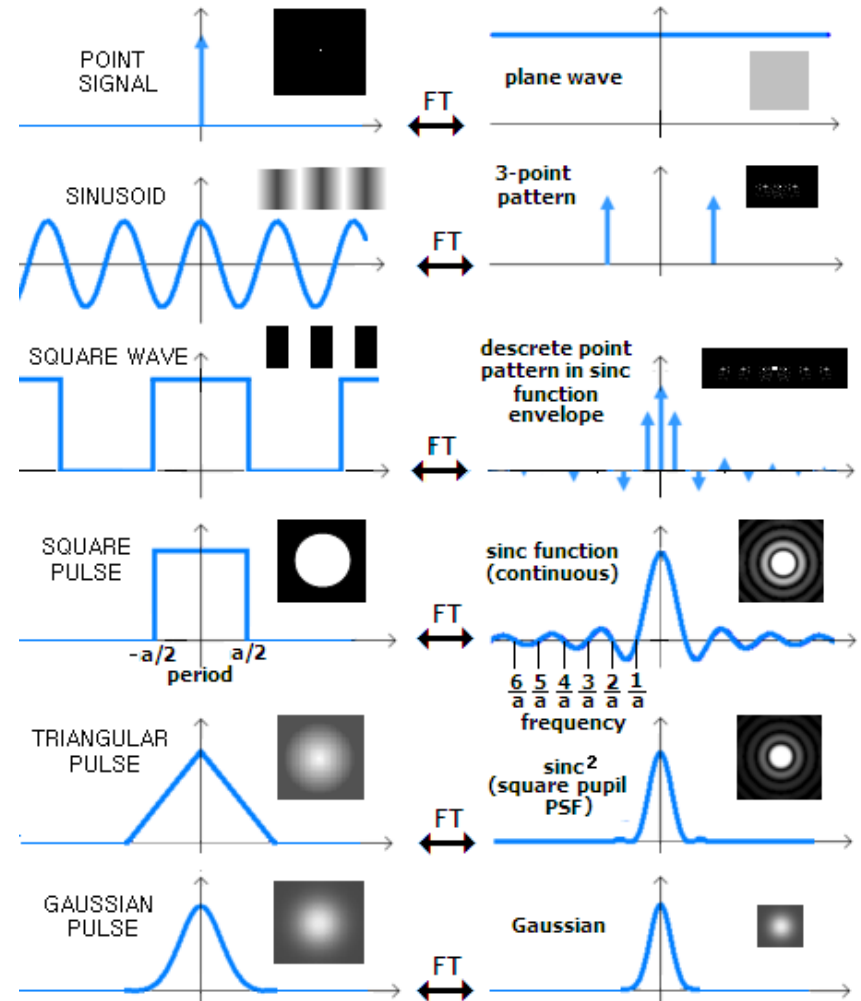
Time Function	Frequency Function
Boxcar $G(t) = \begin{cases} 1, & t < \tau/2 \\ 0, & t > \tau/2 \end{cases}$ 	Sinc $S(f) = \tau \text{sinc}(f\tau)$ $\tau \text{sinc}(f\tau) = (1/\pi f) \sin(\pi f \tau)$ 
Triangle $G(t) = \begin{cases} 1- t /\tau, & t < \tau \\ 0, & t > \tau \end{cases}$ 	Sinc^2 $S(f) = \tau \text{sinc}^2(f\tau)$ $\tau \text{sinc}^2(f\tau) = (1/\pi^2 f^2 \tau) \sin^2(\pi f \tau)$ 
Gaussian $G(t) = e^{-1/2 t^2}$ 	Gaussian $S(f) = \tau(2\pi)^{1/2} e^{-\pi f^2 \tau^2}$ 
Impulse $G(t) = \delta(t)$ $= 0, \quad t \neq 0$ 	DC Shift $S(f) = 1$ 
Sinusoid $G(t) = \cos \omega_0 t$ 	Single Freq. $S(f) = \frac{1}{2}(\delta(f+f_0) + \delta(f-f_0))$ 
Comb. $G(t) = \text{comb}(t)$ $= \sum_{-\infty}^{\infty} \delta(t-n\tau)$ 	Comb. $S(f) = \sum_{-\infty}^{\infty} \delta(f-n/\tau)$ 

FIELD IN EXIT PUIL

AMPLITUDE AS A FUNCTION OF SPATIAL PERIOD

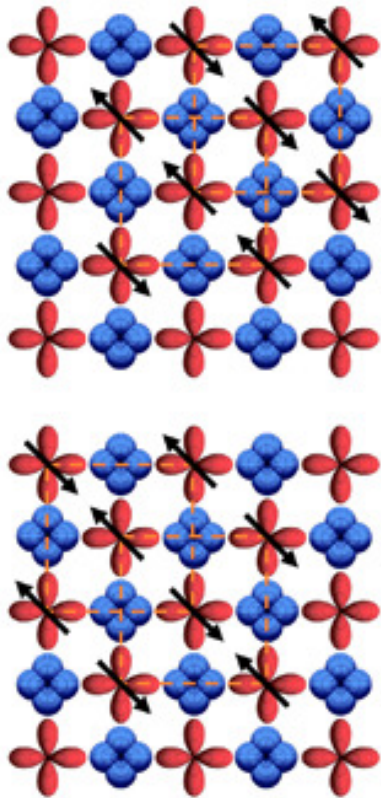
FOURIER TRANSFORM

SPECTRUM OF SINUSOIDAL FREQUENCIES
THE PUPIL FUNCTION DECOMPOSES TO; FIELD DIFFRACTED TO INFINITY IS PROPORTIONAL TO THE FREQUENCY DISTRIBUTION



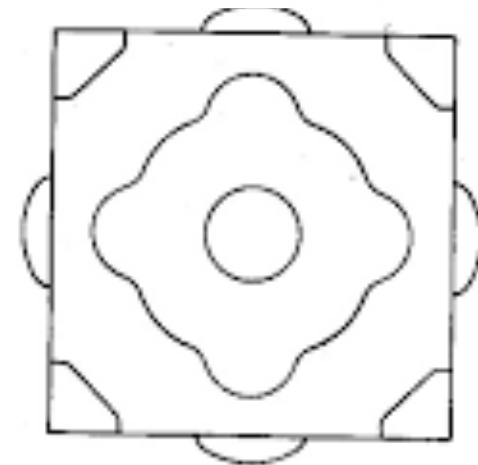
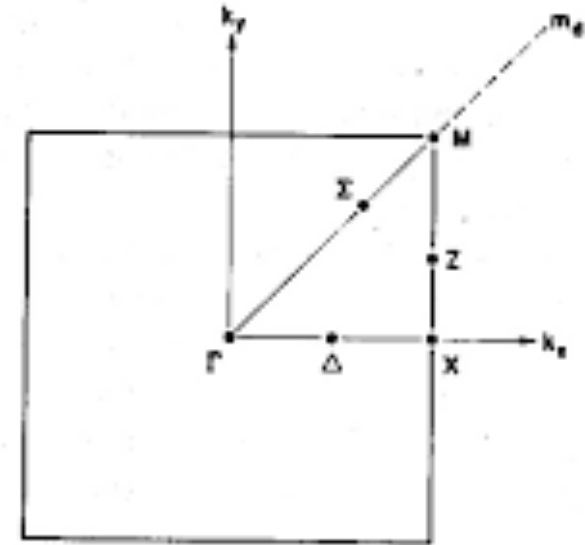
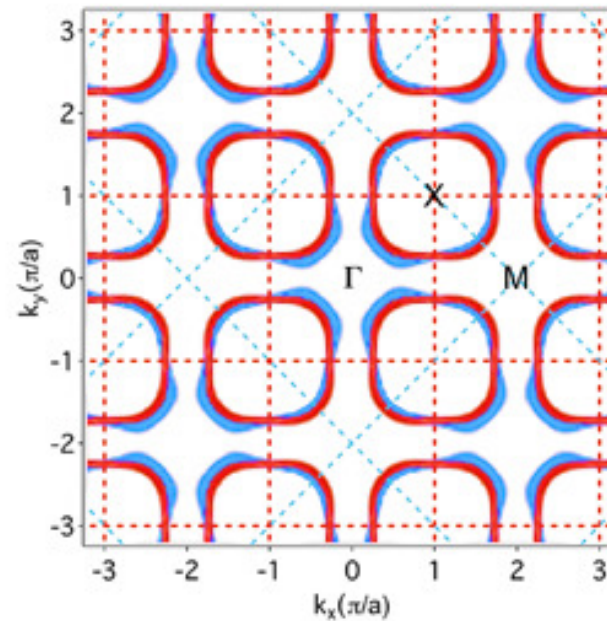
Fourier-Transformation in der Festkörperphysik

Realraum



Fourier-Raum:
 k -Raum,
reziproker Raum

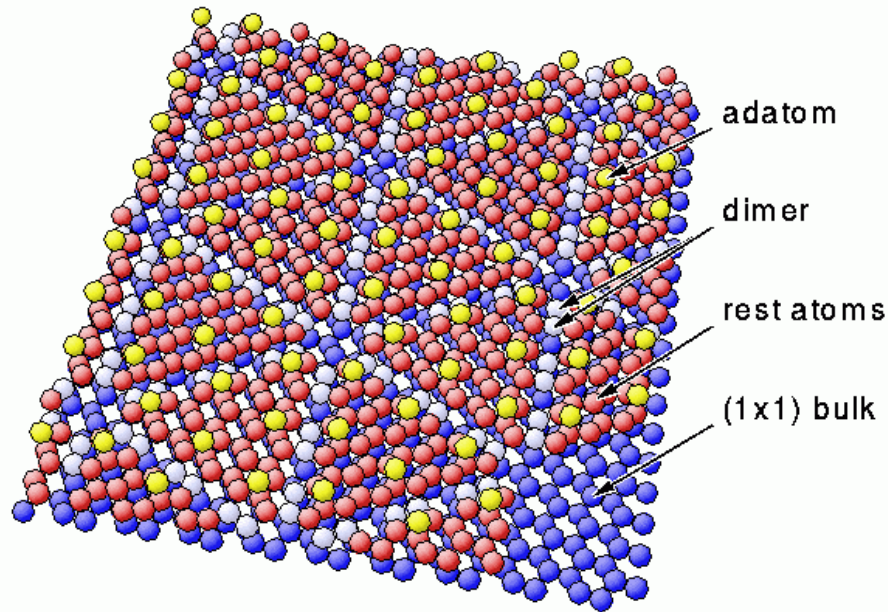
Elektronische Zustände
gleicher Frequenz



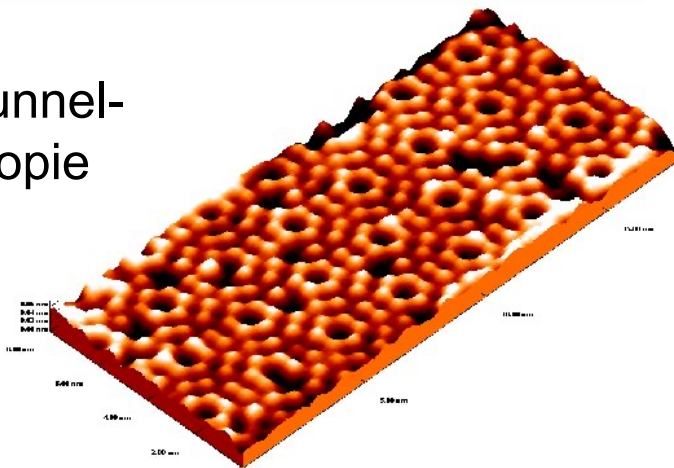
Eigenzustände konstanter Frequenz
in quadratischem Gitter

Fourier-Transformation in Beugungsbildern

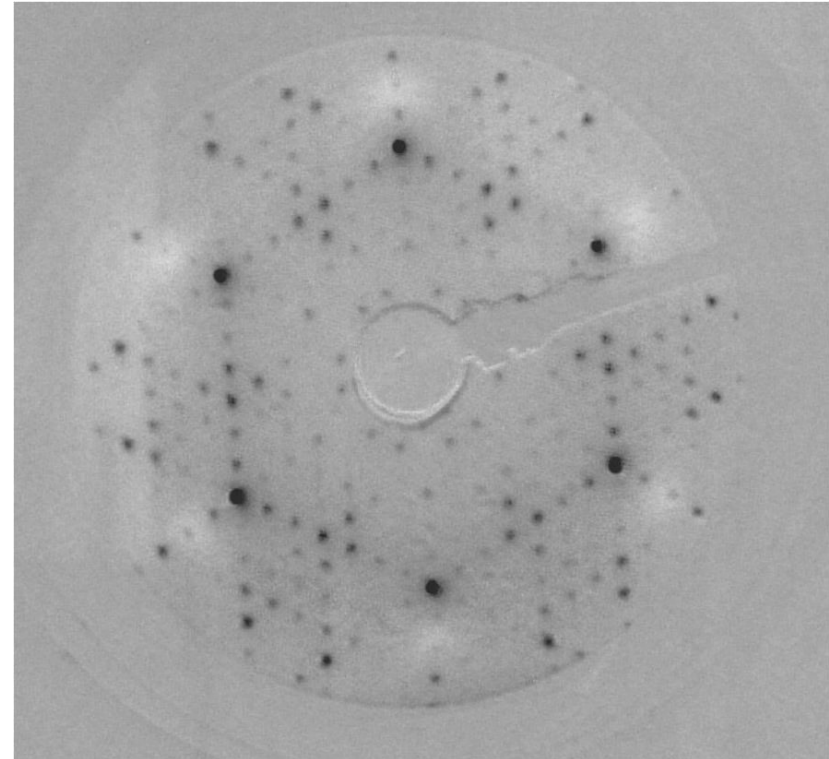
Modell einer Siliziumoberfläche



Rastertunnel-
mikroskopie

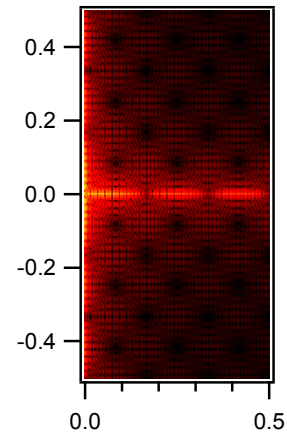
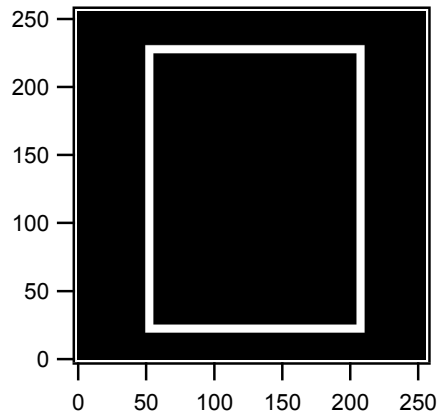


Elektronenbeugungsbild
= *Fouriertransformation* des
atomaren Gitters

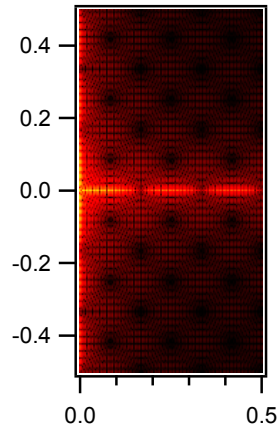
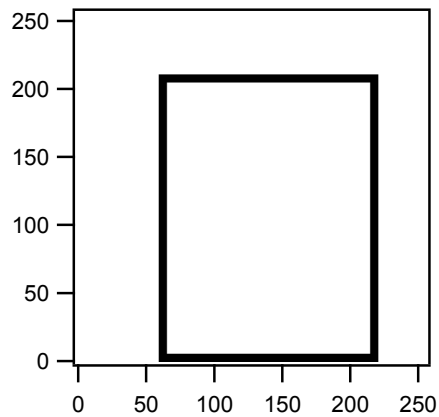


2D Fourier-Transformation

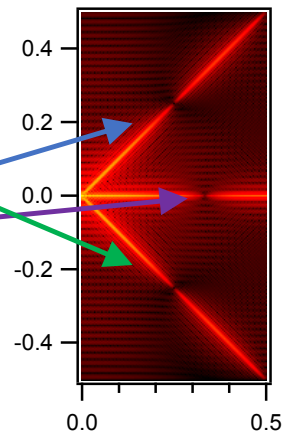
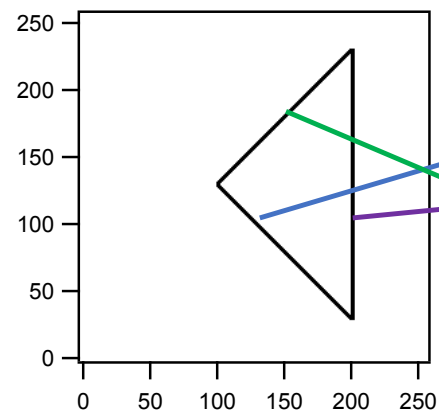
Original



**Betrag der komplexen Fourier-Transformierten:
(log Farbskala)**



**Gleiche Form = gleiche
Amplitudenfunktion**



**Reziproke Linien stehen
senkrecht auf den Linien
im Realraum**