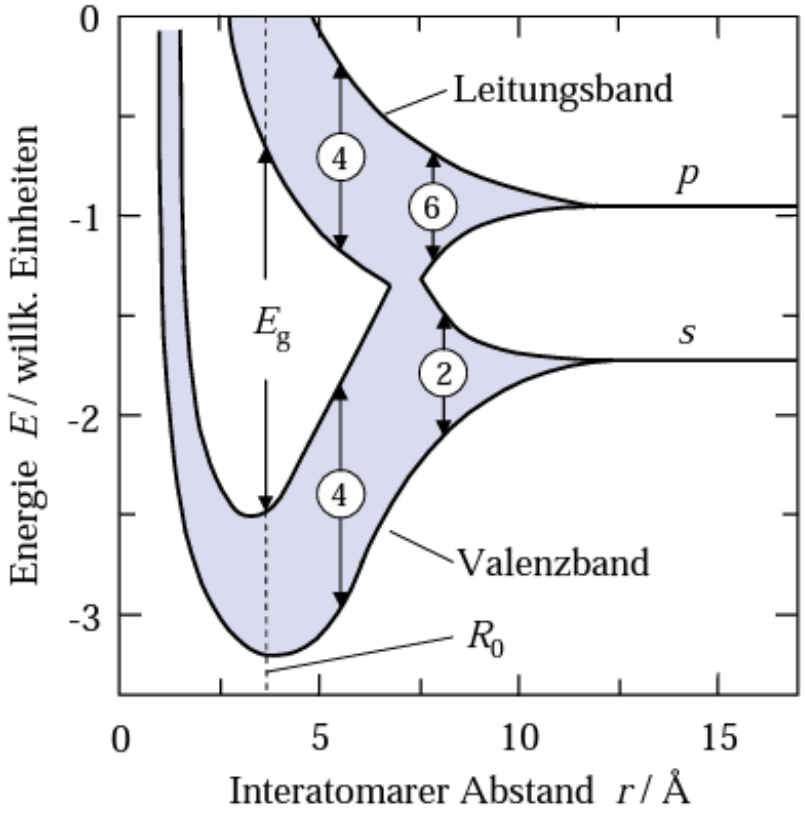
Energiebänder

1. Elektronen in einem schwachen periodischen Potential
2. Bloch-Theorem; Bloch-Funktionen
3. Tight-binding-Model: Stark-gebundene Elektronen
4. Energiedispersionskurven E(k)
5. Brillouin-Zonen und Fermi-Flächen

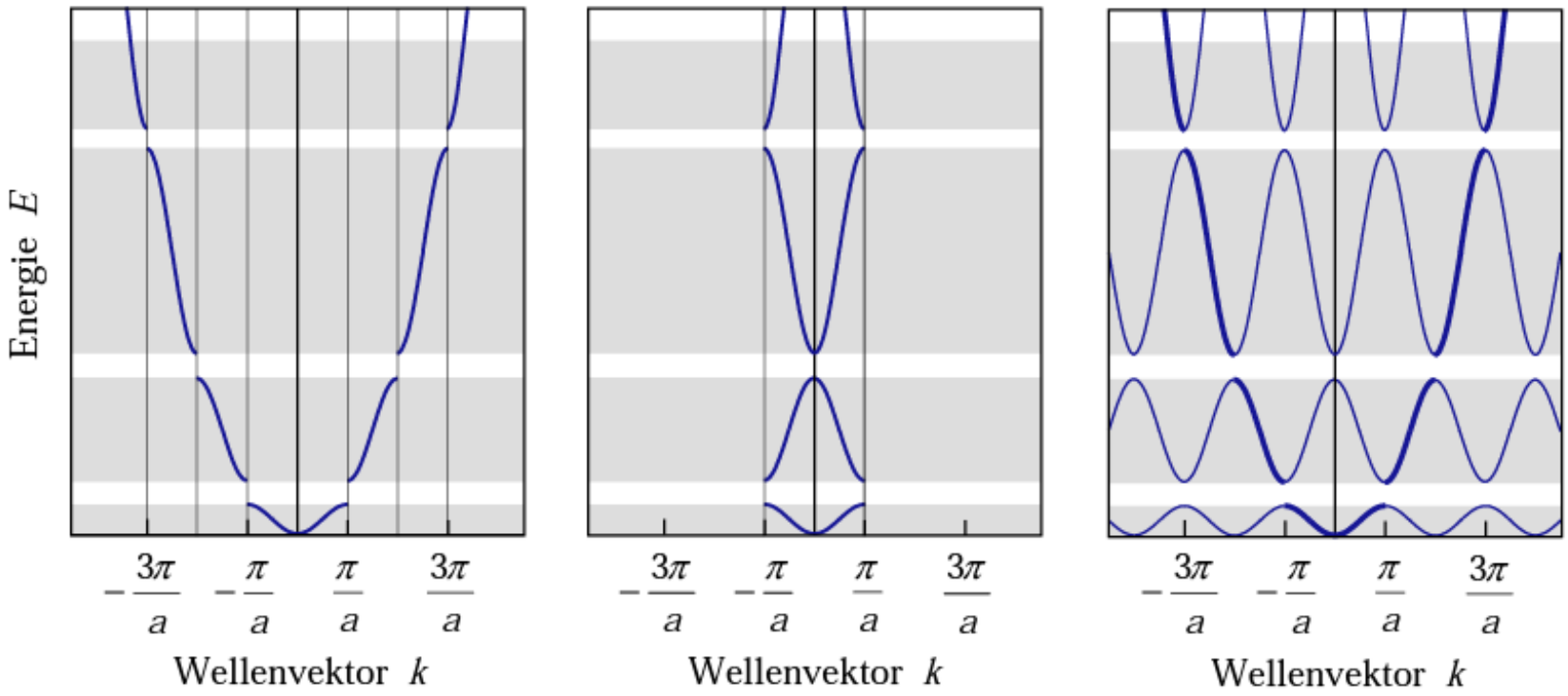
LCAO Rechnung für Diamant

Abstandsabhängigkeil der Energiebänder in Diamant: R_0 = 3,57 Å ; E_g = 5,5 eV



© A.H. Wilson, *The Theory of Metals* (1965)

Energiedispersionskurven

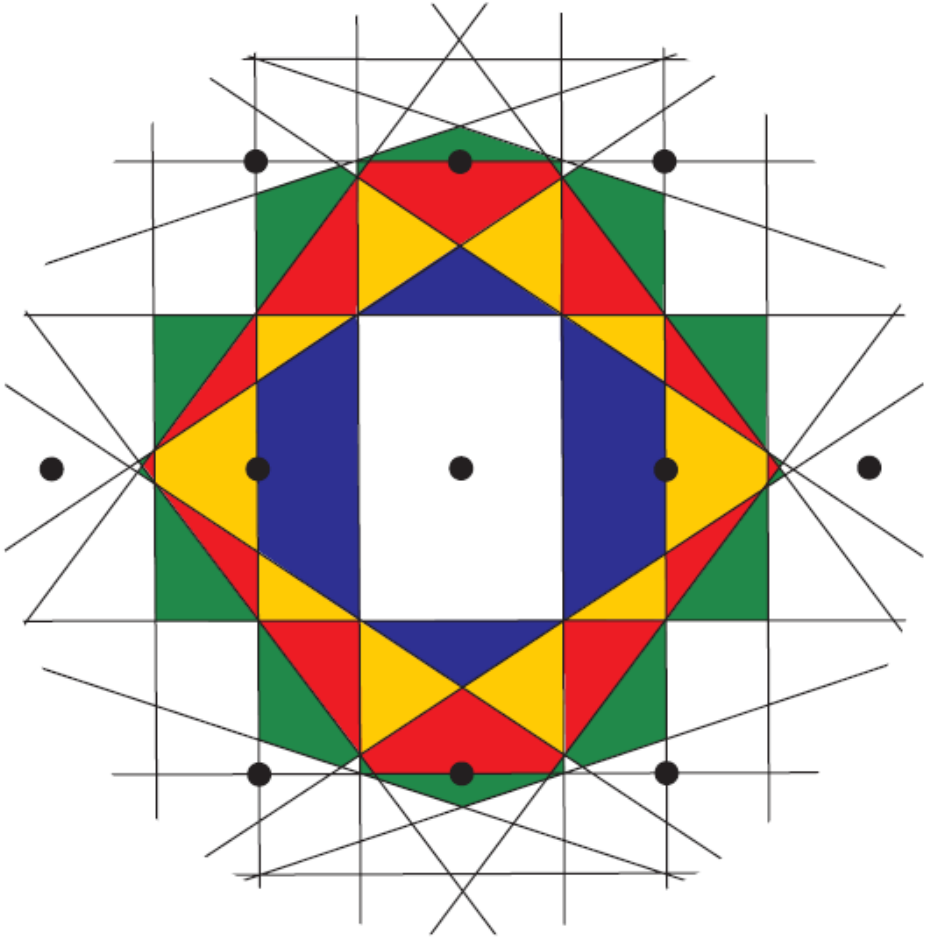


erweitertes Zonenschema

reduziertes Zonenschema

periodisches Zonenschema

Brillouin-Zonen des ebenen Rechteck-Gitters



1. Brillouin-Zone

2. Brillouin-Zone

3. Brillouin-Zone

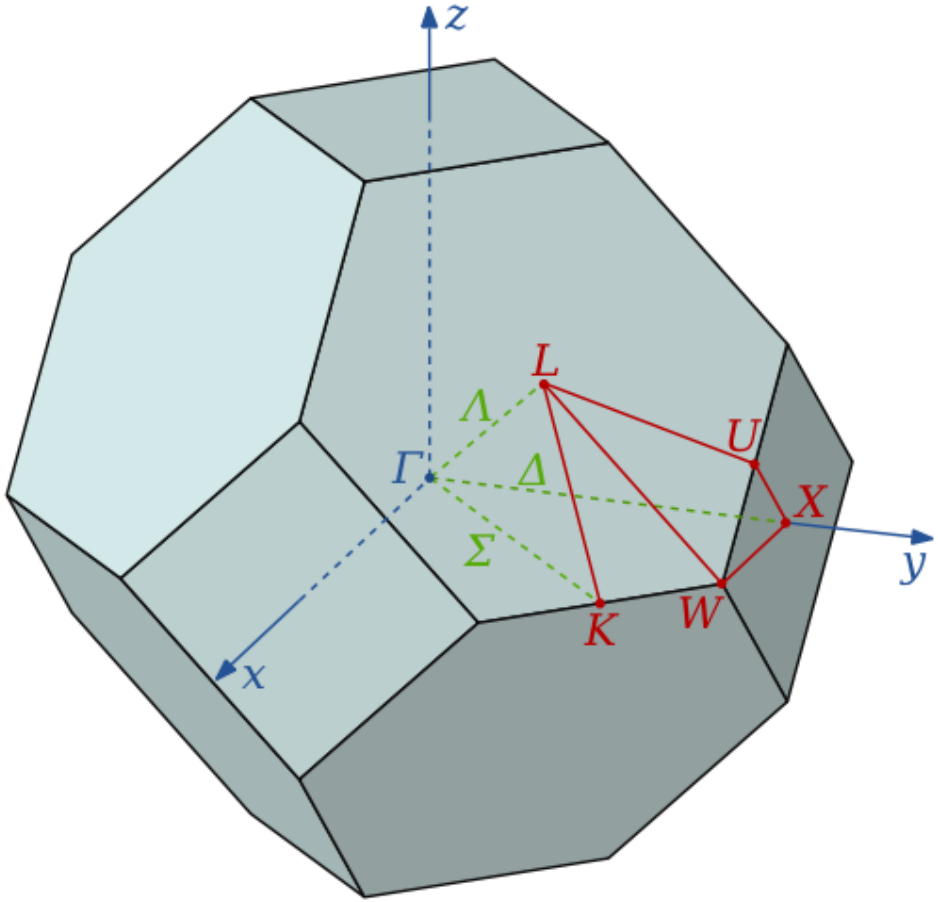
4. Brillouin-Zone

5. Brillouin-Zone

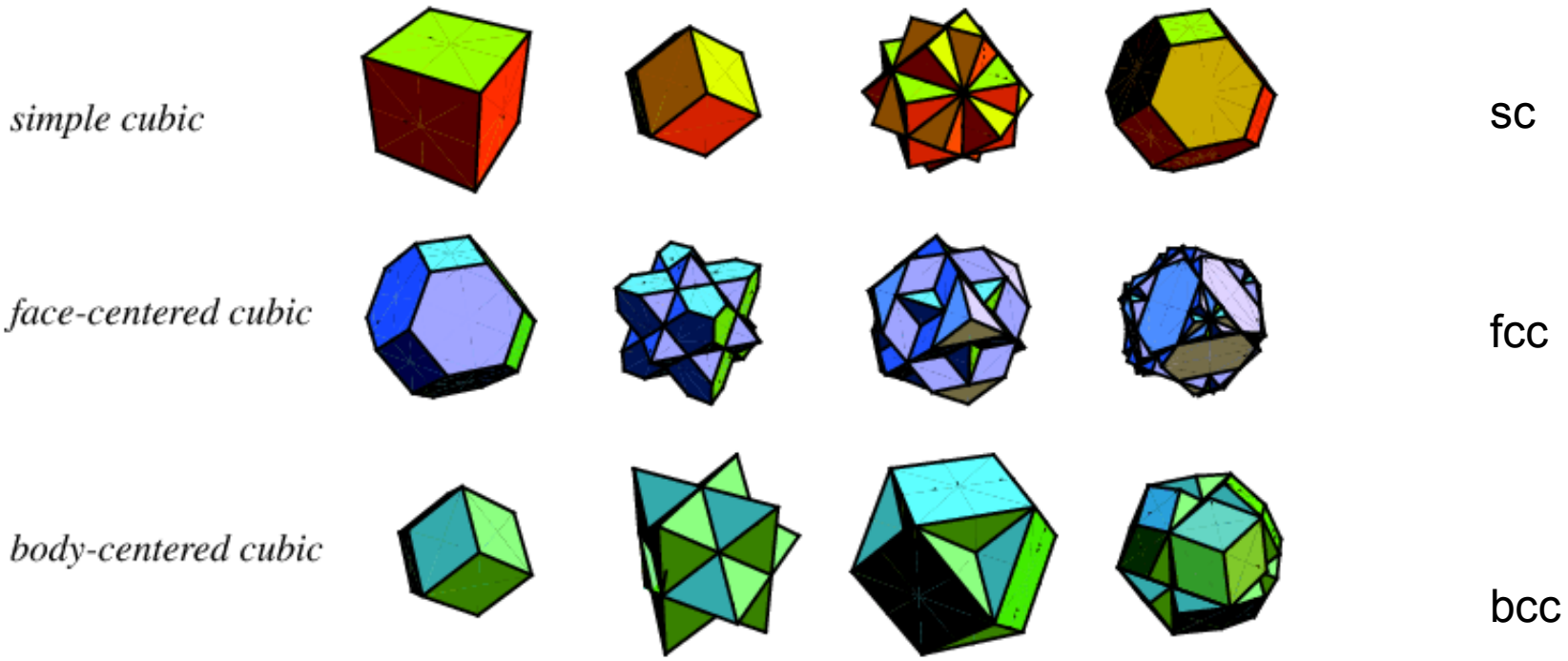
Erste Brillouin-Zone eines kubisch-flächenzentrierten Gitters

1.BZ

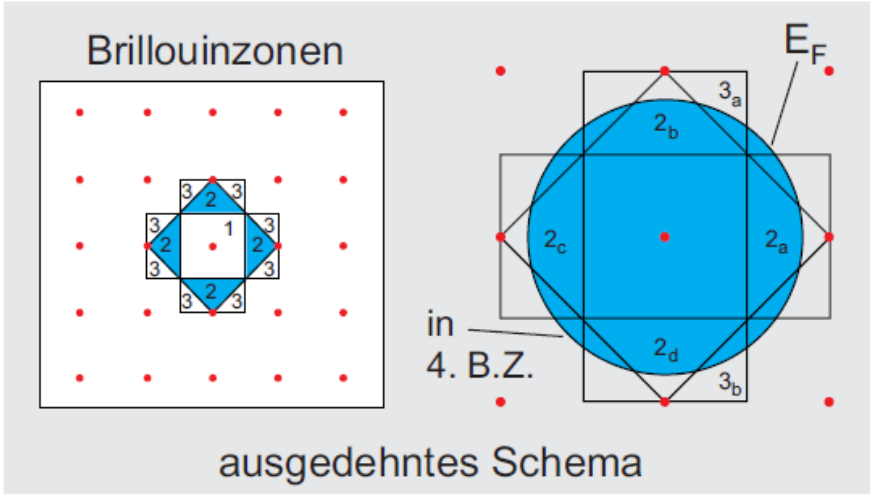
fcc

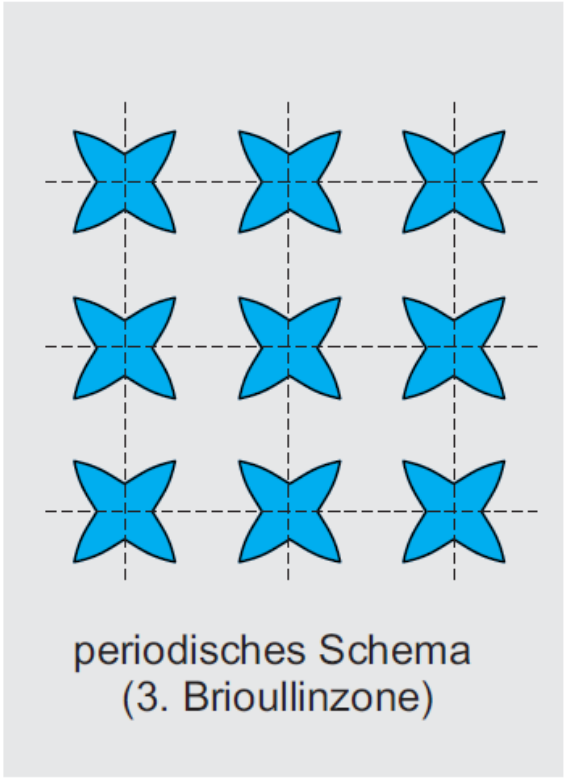


Brillouin Zonen

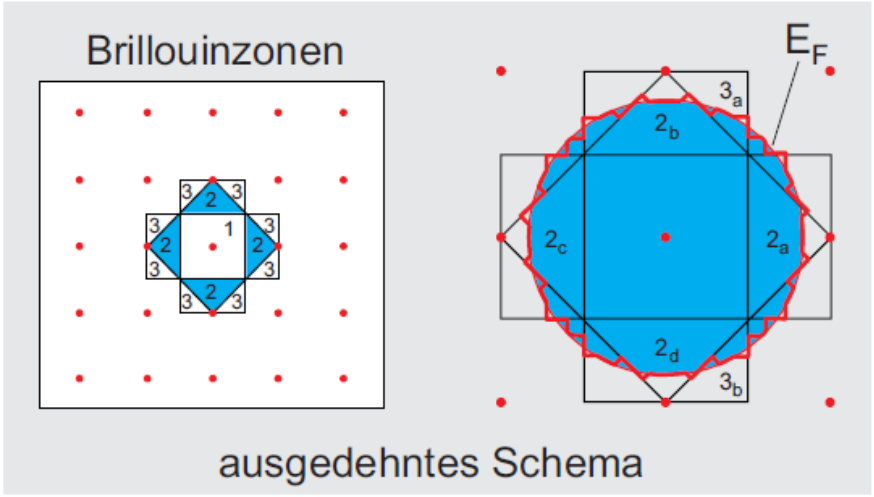


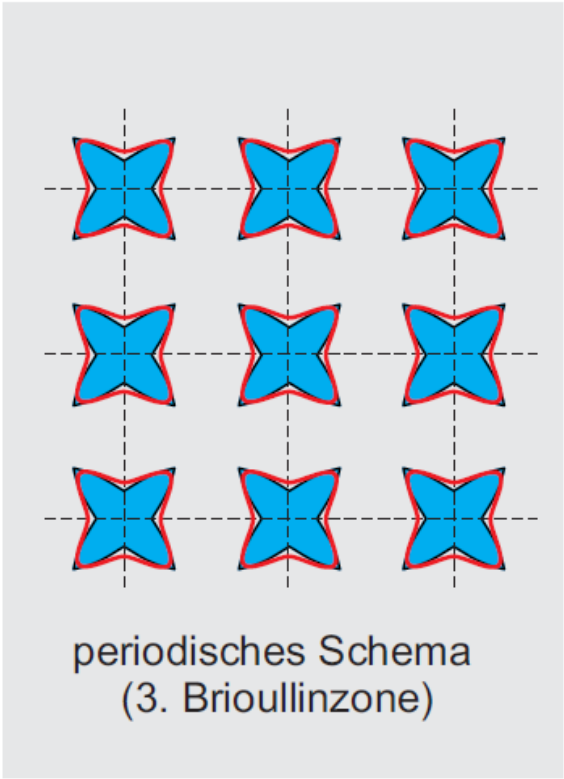
Fermifläche des freien Elektronengases





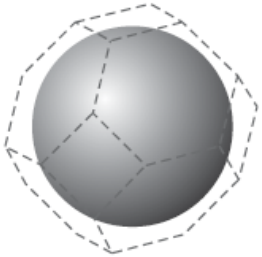
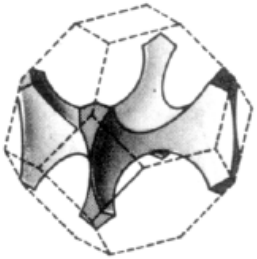
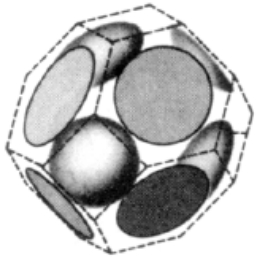
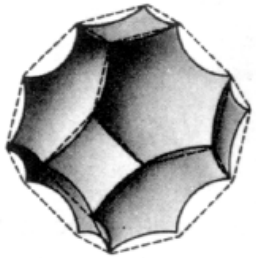
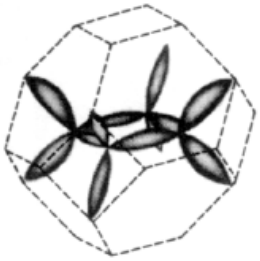
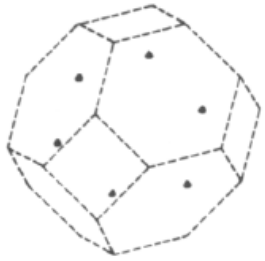
Fermifläche für Elektronen im periodischen Potenzial



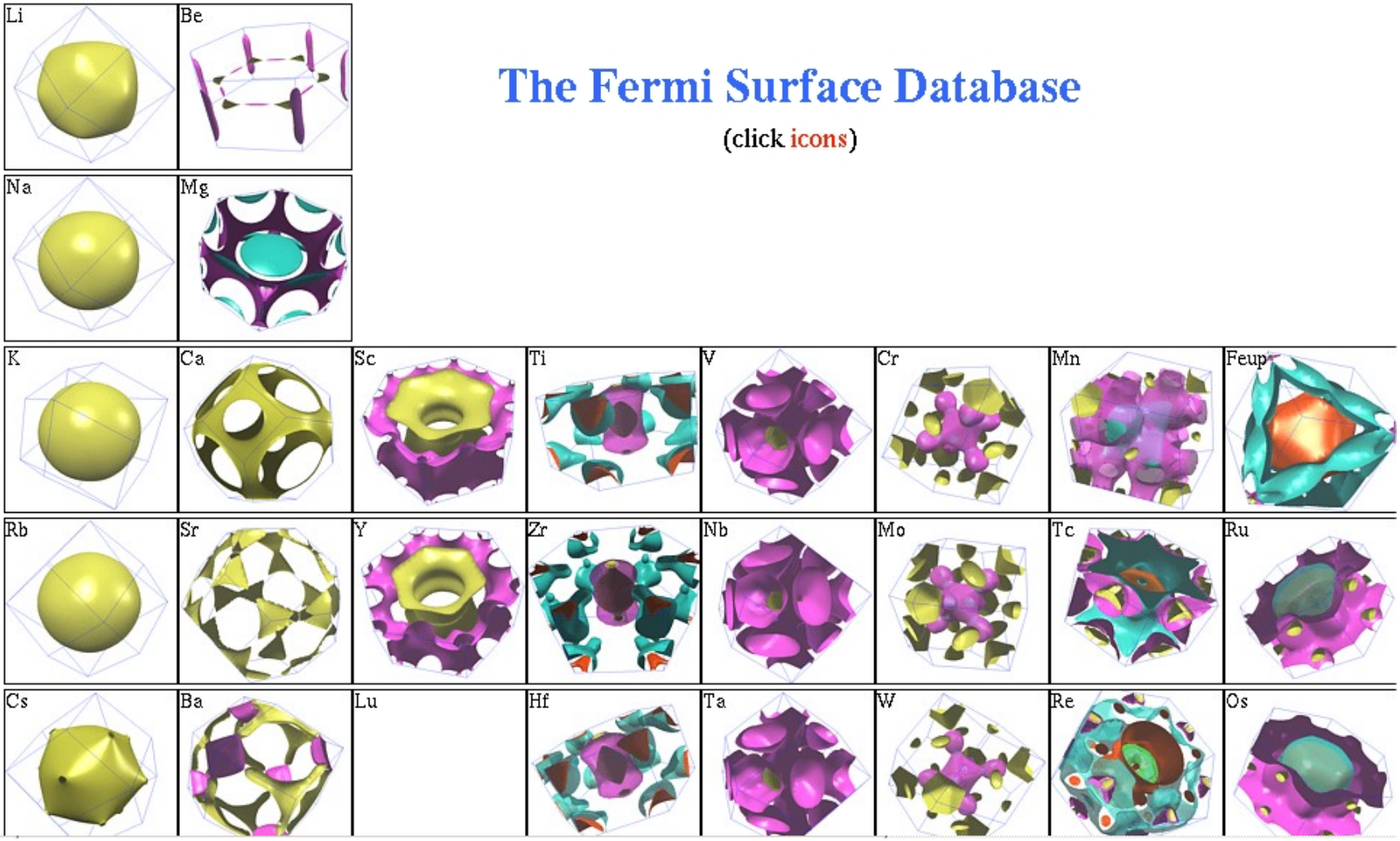


Fermiflächen von fcc-Metallen für freie Elektronen

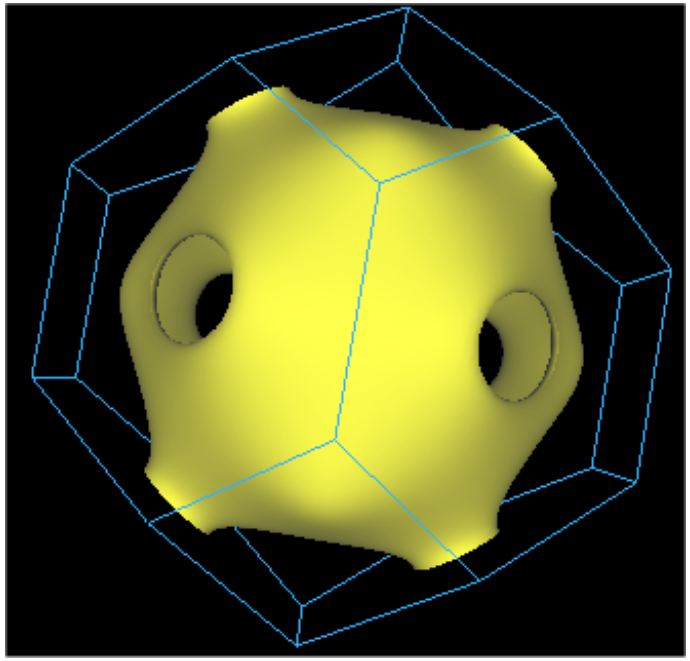
Anteile in verschiedenen Brillouin-Zonen

	erste Zone	zweite Zone	dritte Zone	vierte Zone
einwertig		—	—	—
zweiwertig			—	—
dreiwertig	—			

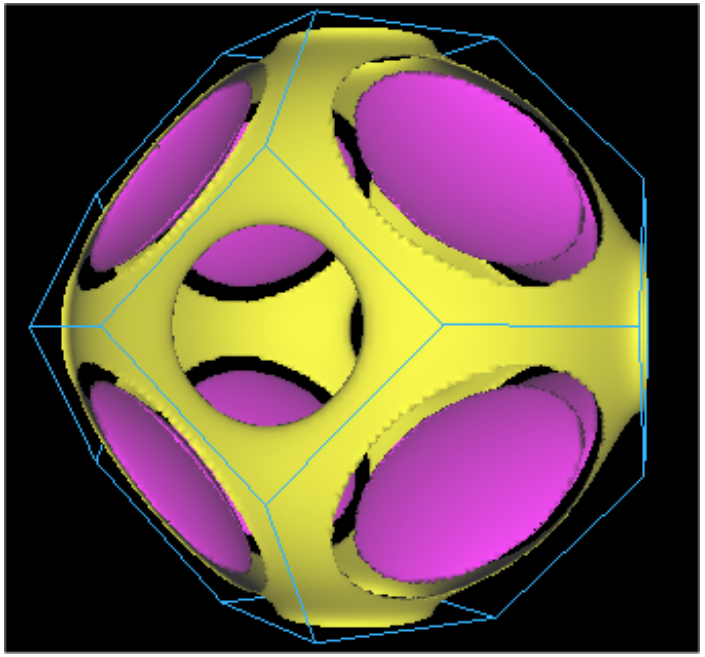
The Fermi Surface Database
http://www.phys.ufl.edu/fermisurface/



z.B.
http://www.phys.ufl.edu/fermisurface/



Cu



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