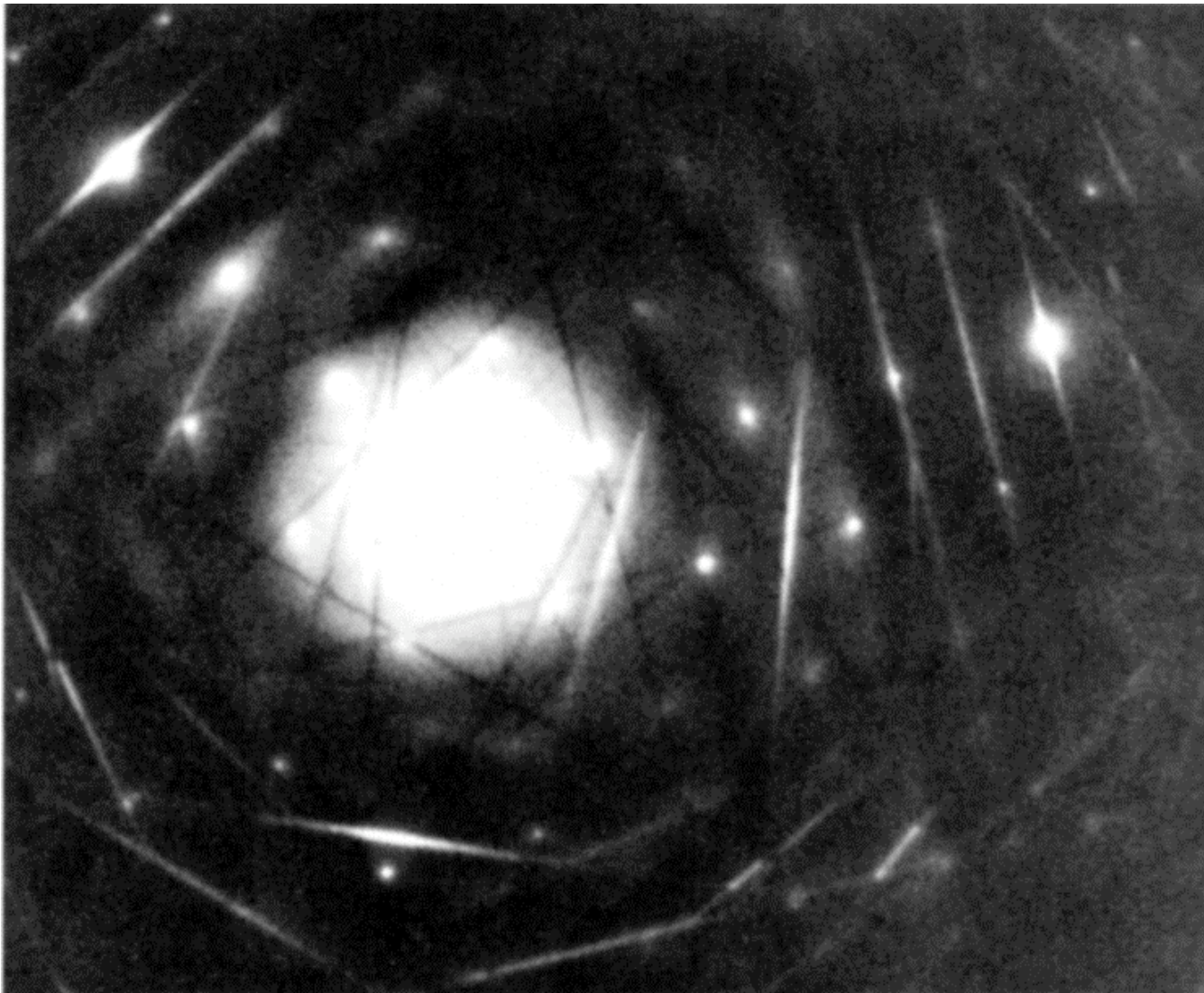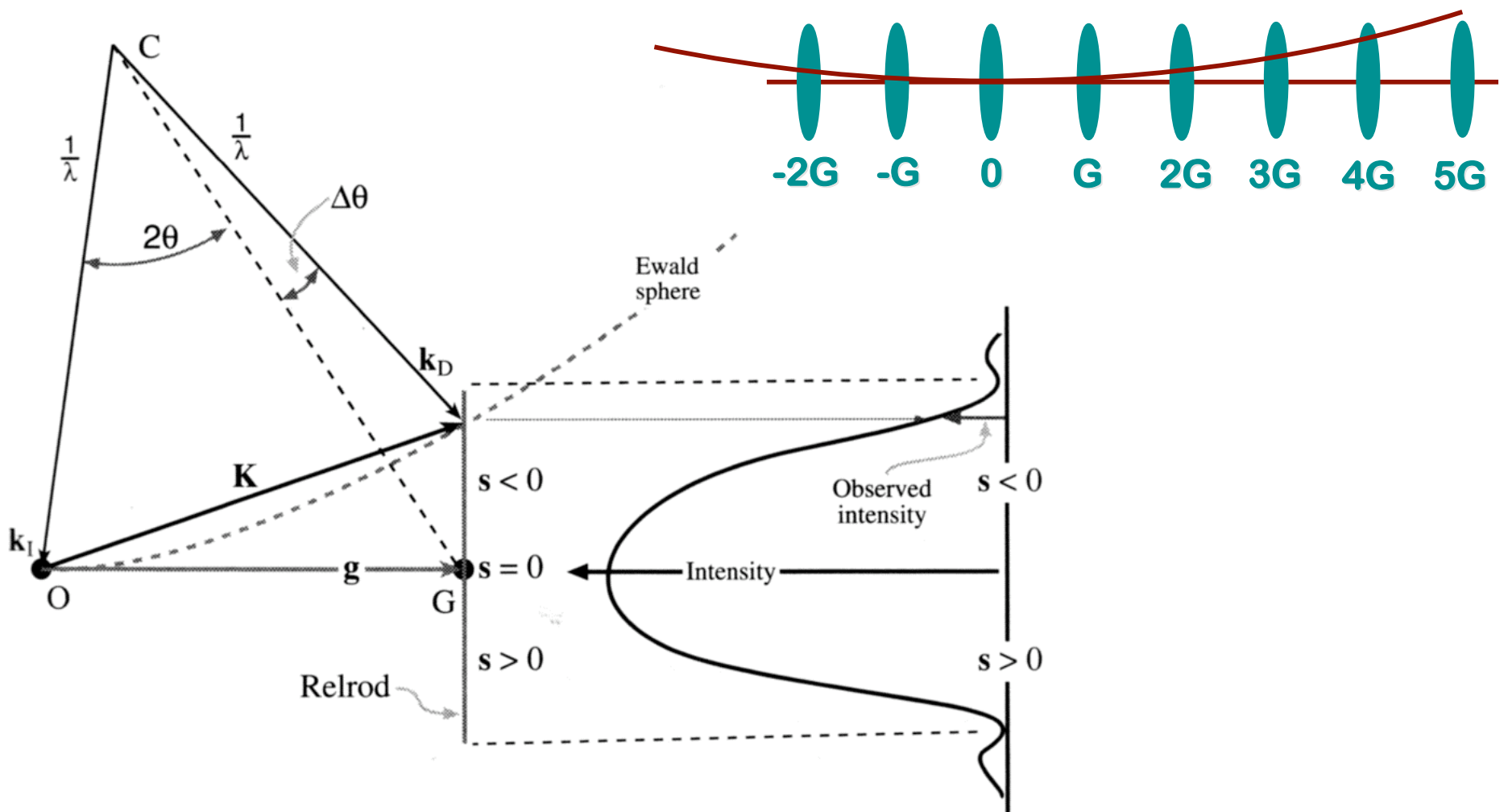# Lectures 5, 6, 7

Review

Example Kikuchi pattern

Shape factor
thin foil effect - 'rel-rods'

Structure Factor
body-centered cubic

Two atom basis : $r = (0,0,0)$ & $r = \left(\dfrac{1}{2}, \dfrac{1}{2}, \dfrac{1}{2}\right)$

$$F = f\left\{\exp\left[-2\pi i(0 \cdot h + 0 \cdot k + 0 \cdot l)\right] + \exp\left[-2\pi i\left(\dfrac{1}{2} \cdot h + \dfrac{1}{2} \cdot k + \dfrac{1}{2} \cdot l\right)\right]\right\}$$

$$= f\left\{1 + \exp\left[-\pi i(h + k + l)\right]\right\}$$

h, k & l are integers, so $h + k + l = N$ (where N is an integer)

The exponential can then take one of two values :

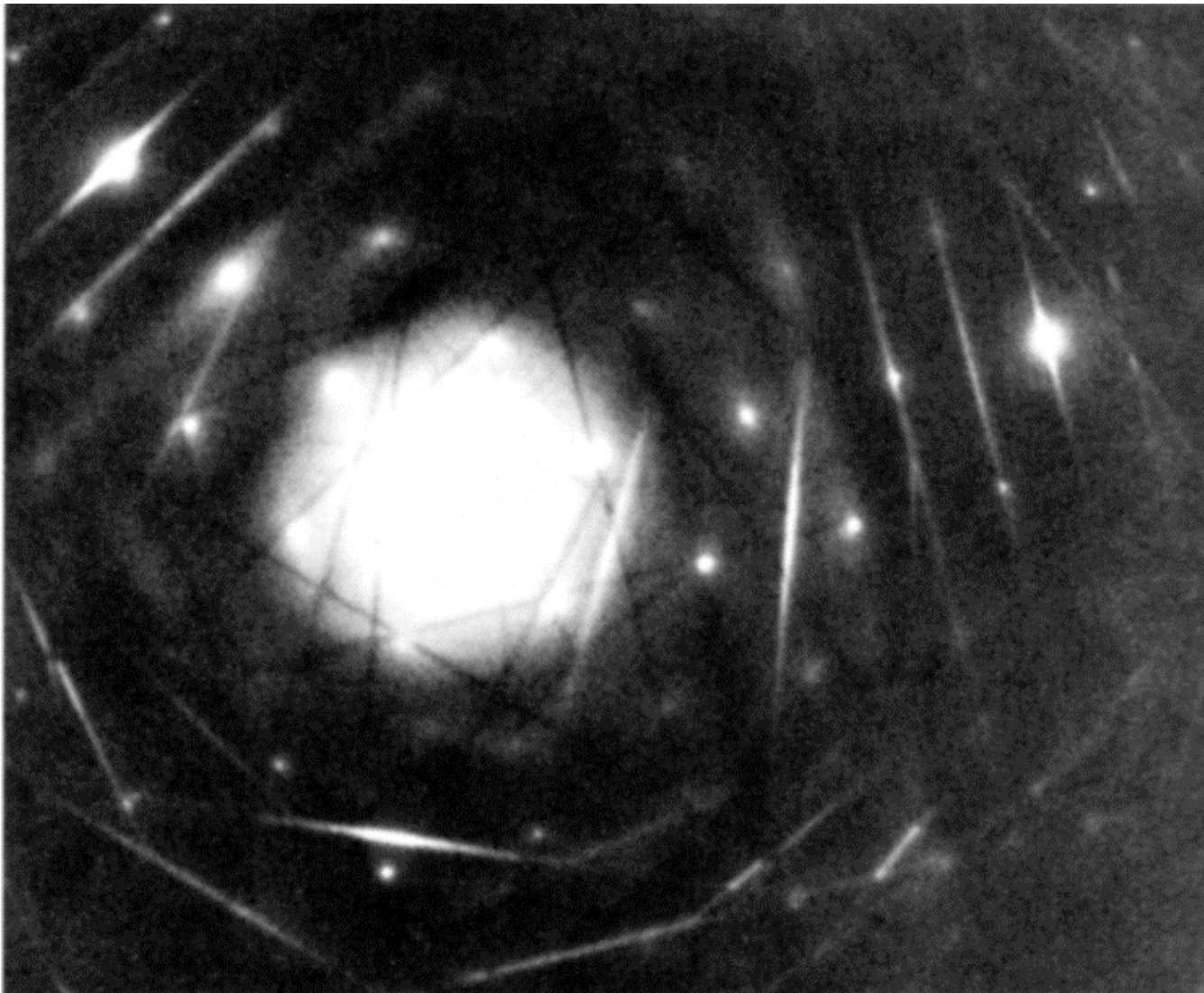$$\exp\left[-\pi i(h + k + l)\right] = +1 \quad \text{if} \quad N = \text{even}$$

$$\exp\left[-\pi i(h + k + l)\right] = -1 \quad \text{if} \quad N = \text{odd}$$

So :

$$F = 2f \quad \text{if} \quad N = \text{even}$$

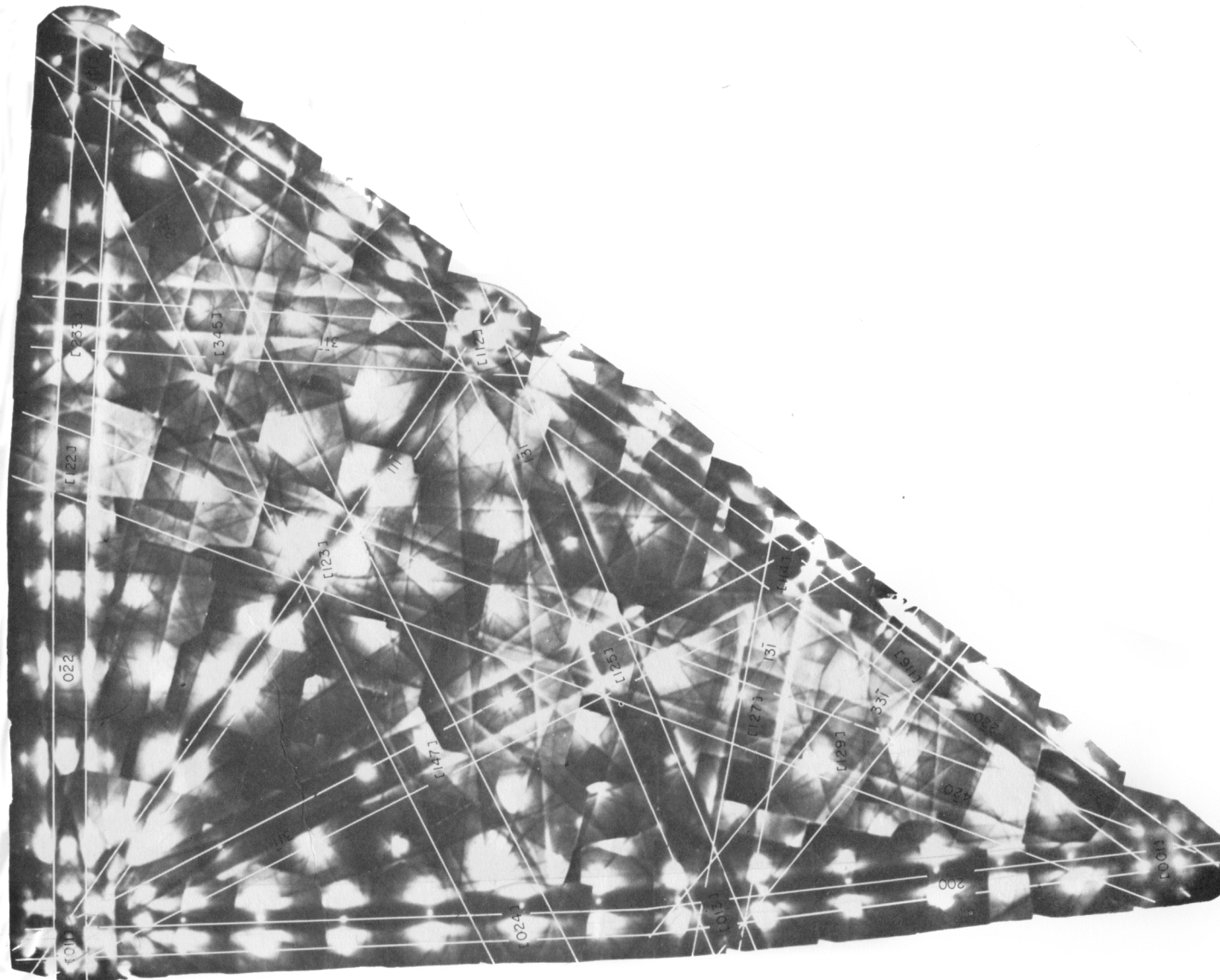$$F = 0 \quad \text{if} \quad N = \text{odd}$$

Example Kikuchi pattern
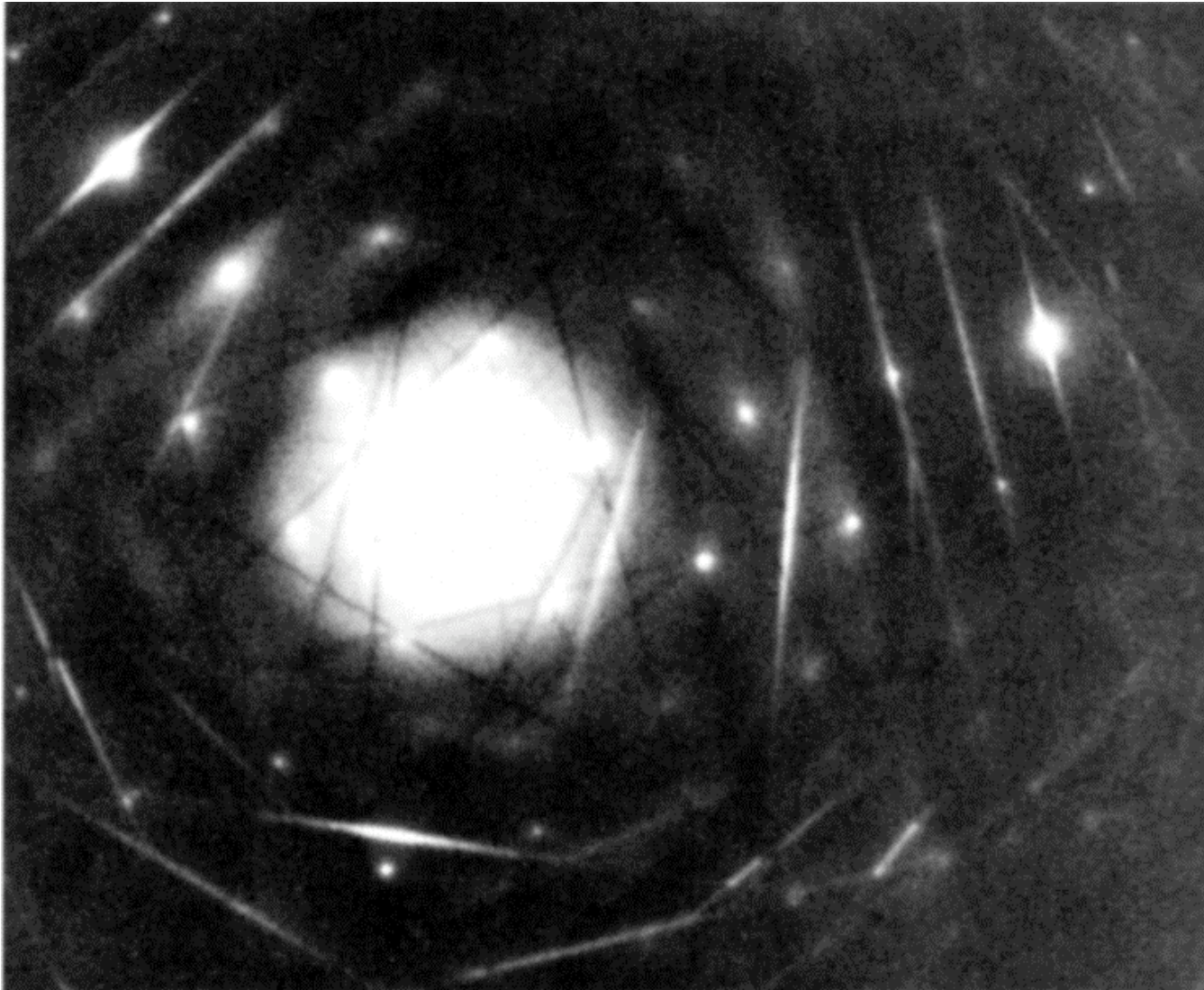
Kikuchi lines & maps
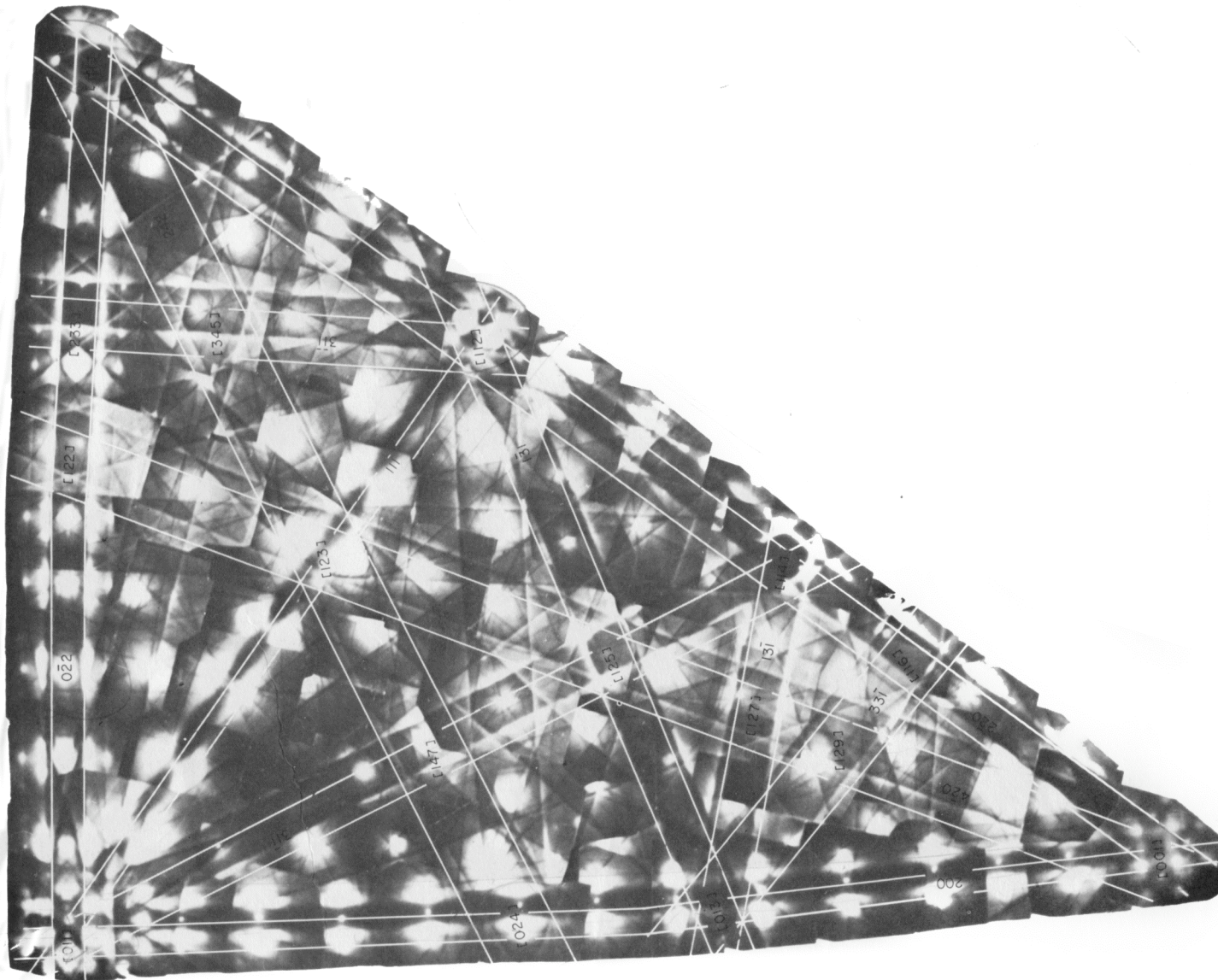## example: fcc

Example Kikuchi pattern
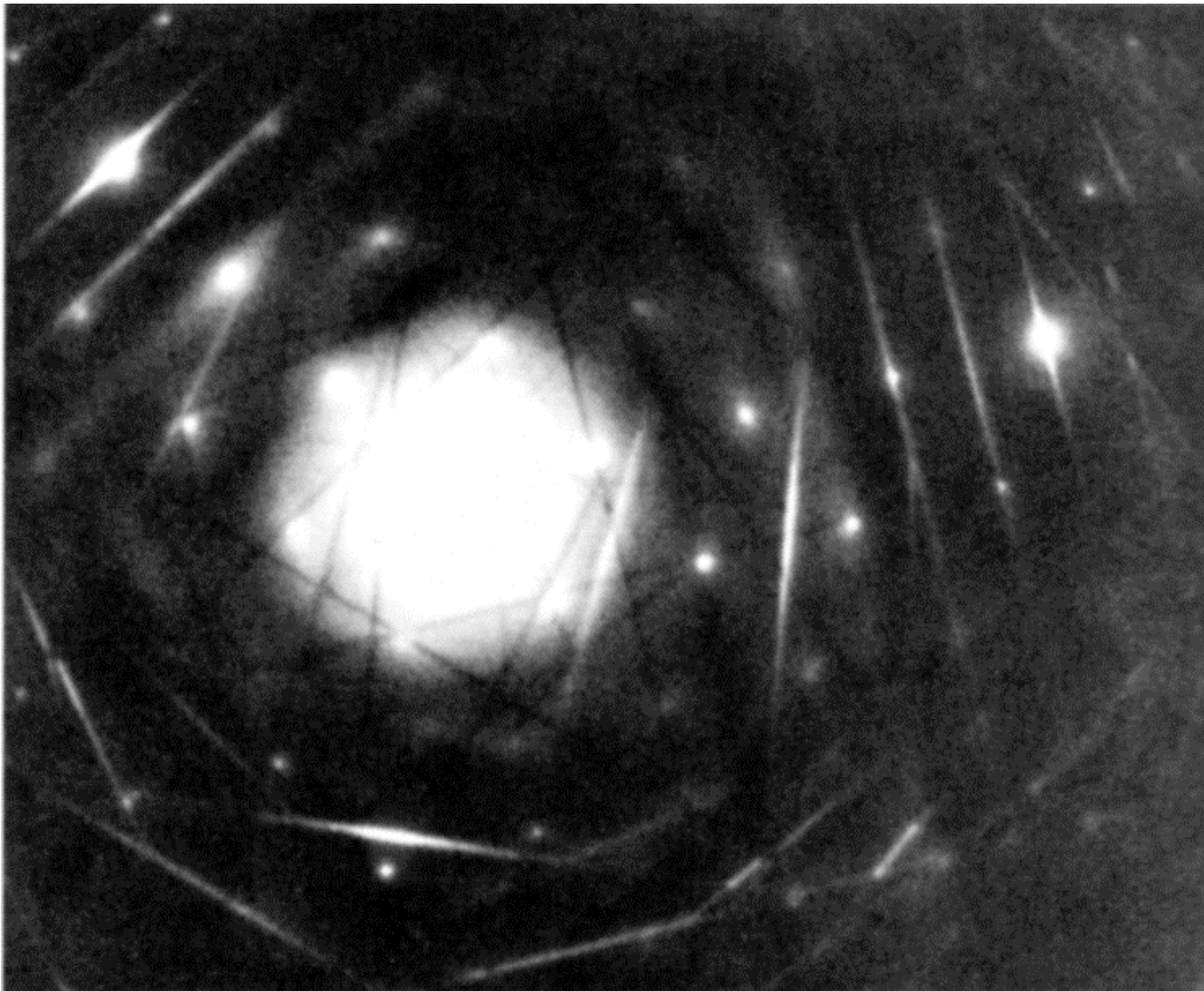
Kikuchi lines & maps
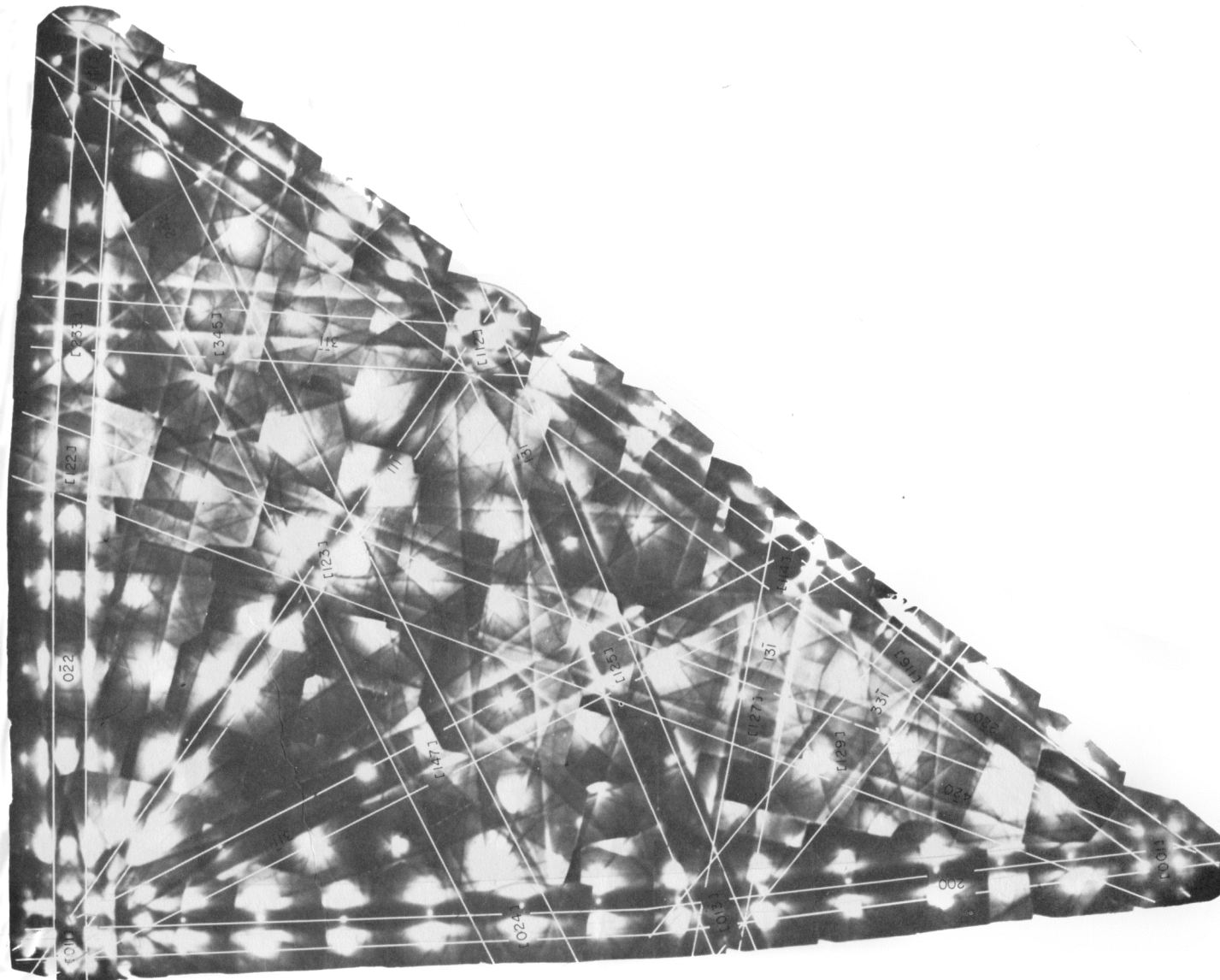## example: fcc

Example Kikuchi pattern

Kikuchi lines & maps
example: fcc

Example Kikuchi pattern