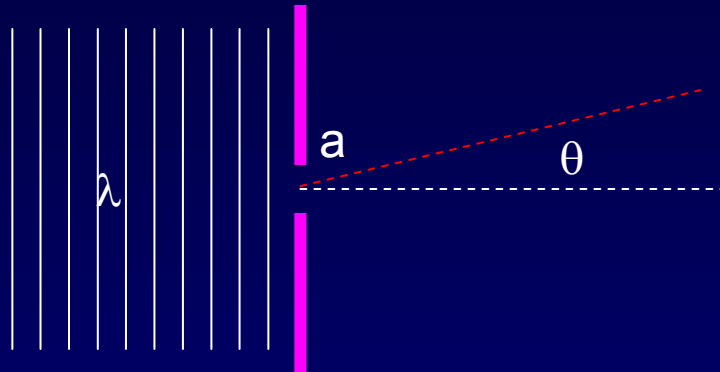


# Diffraction and the Uncertainty Principle

Remember single-slit diffraction:



Wavelength:  $\lambda$   
Slit width:  $a$   
Diffraction angle:  $\theta = \lambda/a$   
angle to first zero

Let's analyze this problem using the uncertainty principle.

Suppose a beam of electrons of momentum  $p$  approaches a slit of width  $a$ . How big is the angular spread of motion after it passes through the slit?

