Applications of the course

Lecture 38

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1. Speech synthesis
2. Convolution neural networks
3. Health applications
4. Optics and Spatial filtering
5. And some more

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1. Speech synthesis
2. Convolution neural networks
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4. *Optics and Spatial filtering*
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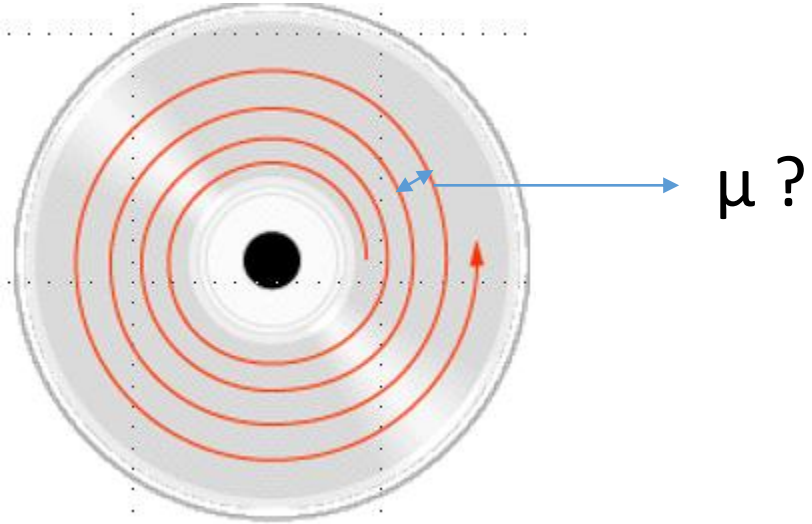
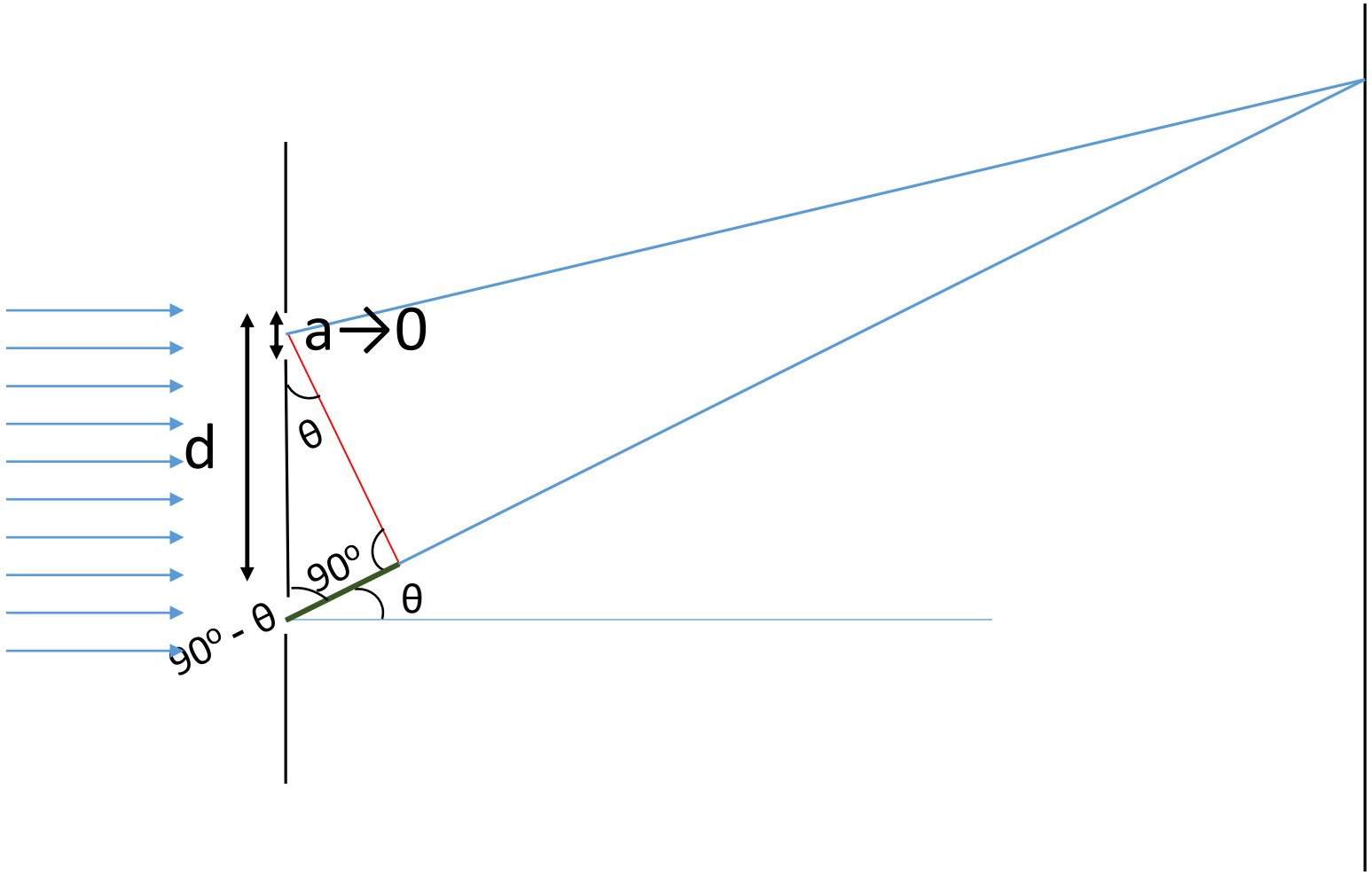
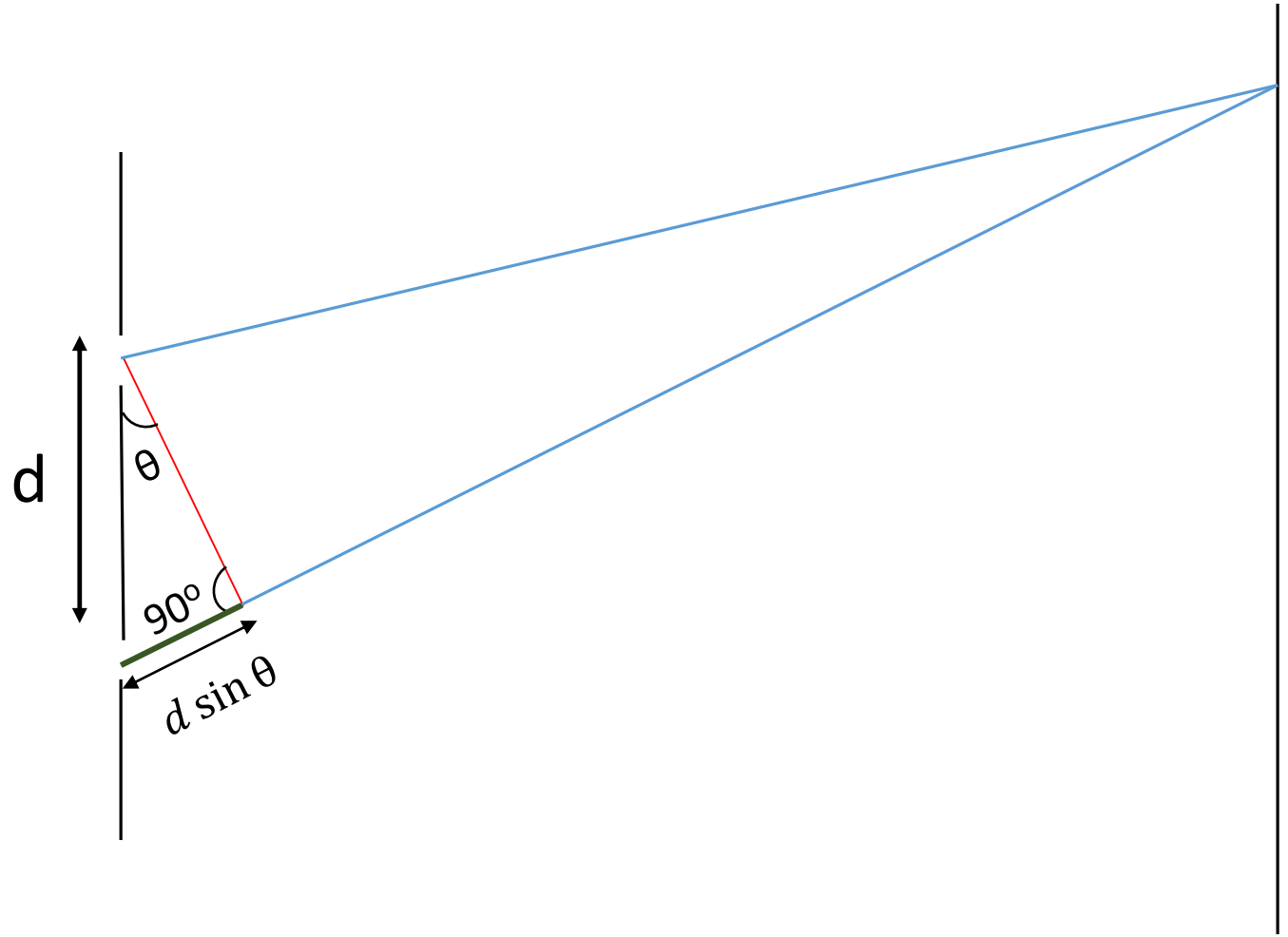
Data track spacing?



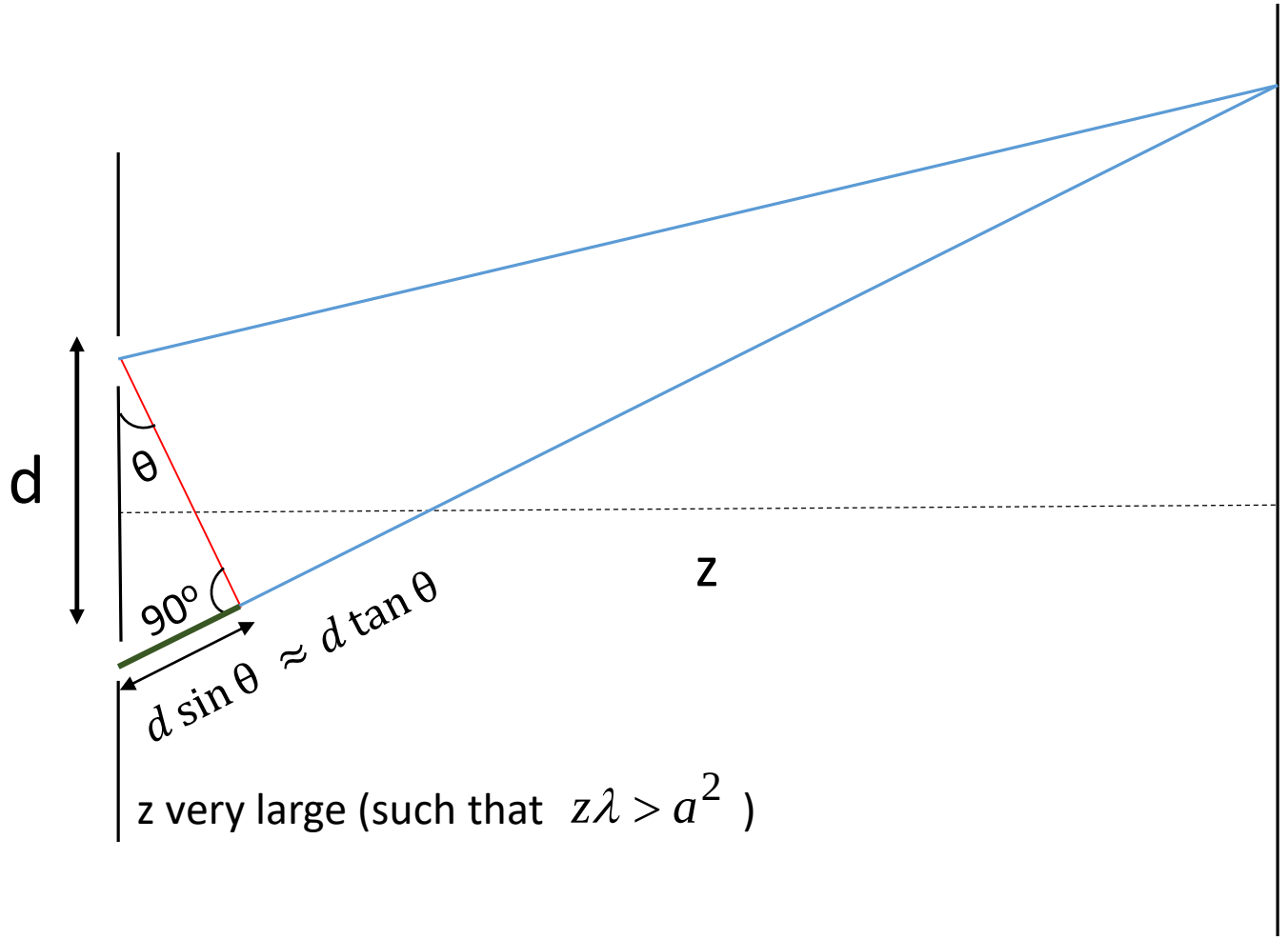
Young’s double slit experiment



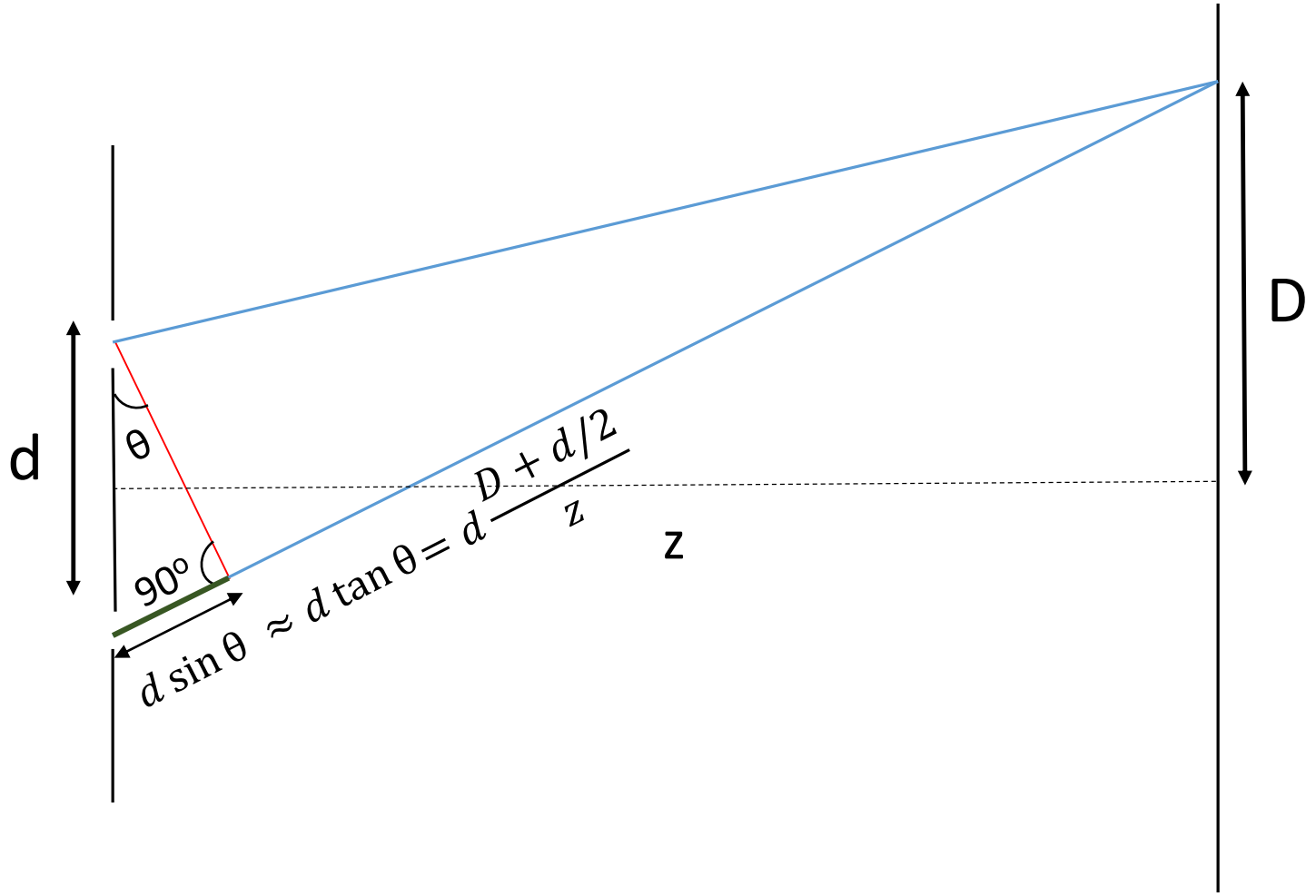
Young’s double slit experiment



Young's double slit experiment



Young's double slit experiment



Young's double slit experiment

$$\frac{2\pi}{\lambda}\left(d\sin\theta\right)=2\pi m$$

$$d\sin\theta=m\lambda$$

$$d\frac{D+d/2}{z}=\lambda$$

$$dD+\frac{d^2}{2}=z\lambda$$

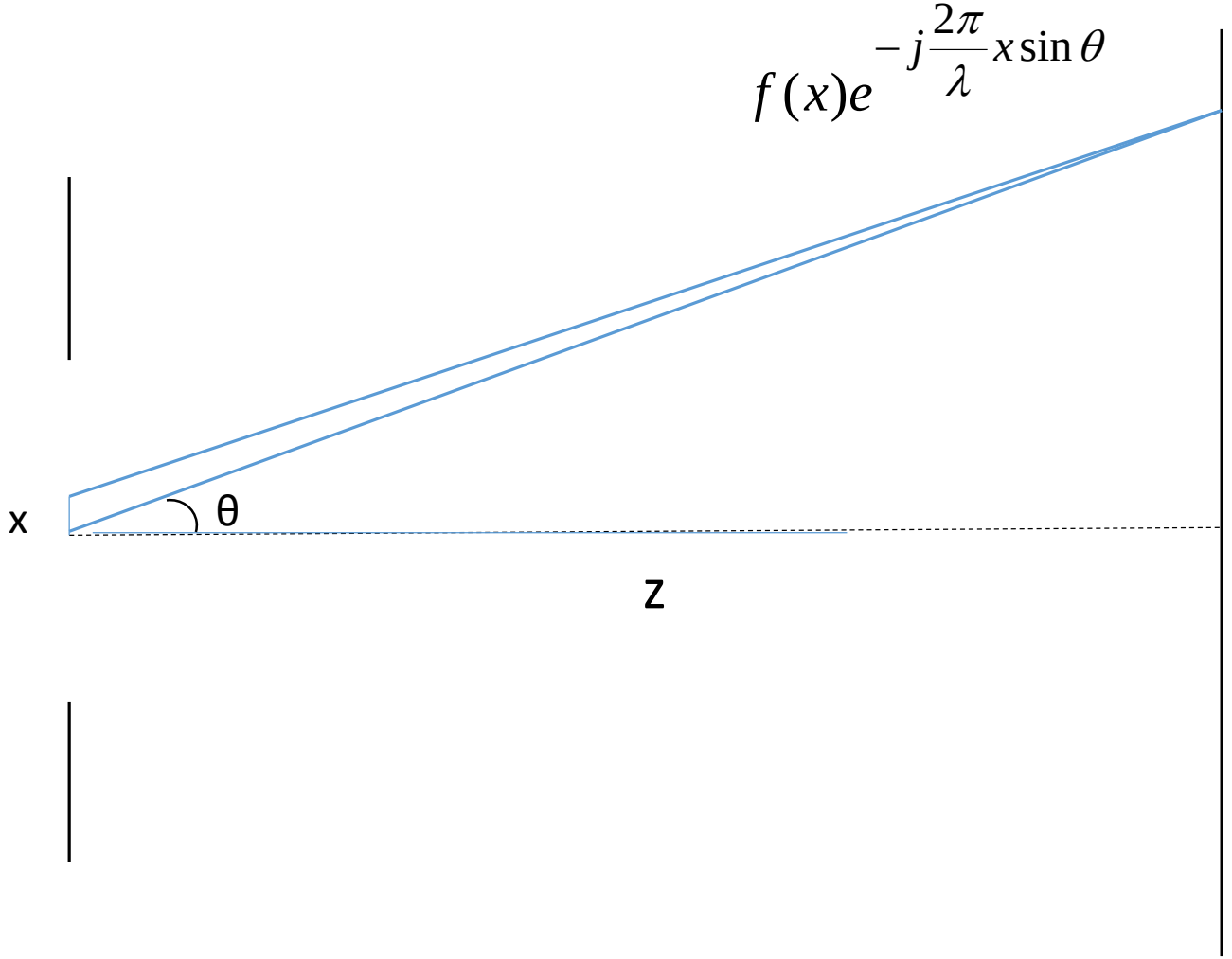
$$d\approx\frac{z\lambda}{D}$$

CD track length

$$d \approx \frac{z\lambda}{D}$$

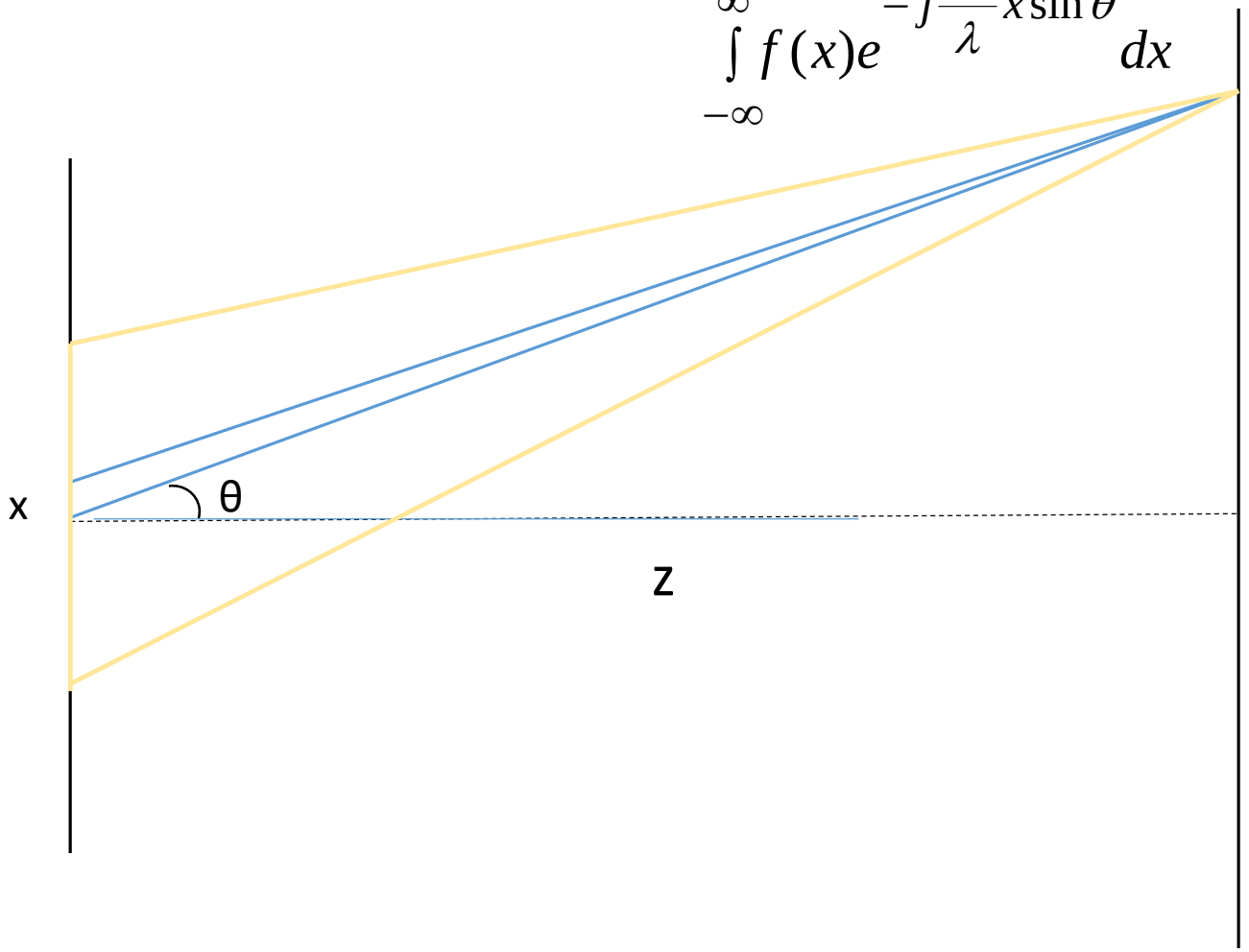
$$d \approx \frac{2.7\ feet \times 600nm}{1\ feet} \approx 1600nm$$

Diffraction (Fraunhofer)



Diffraction (Fraunhofer)

$$\int_{-\infty}^{\infty} f(x) e^{-j\frac{2\pi}{\lambda} x \sin\theta} dx$$



Diffraction (Fraunhofer)

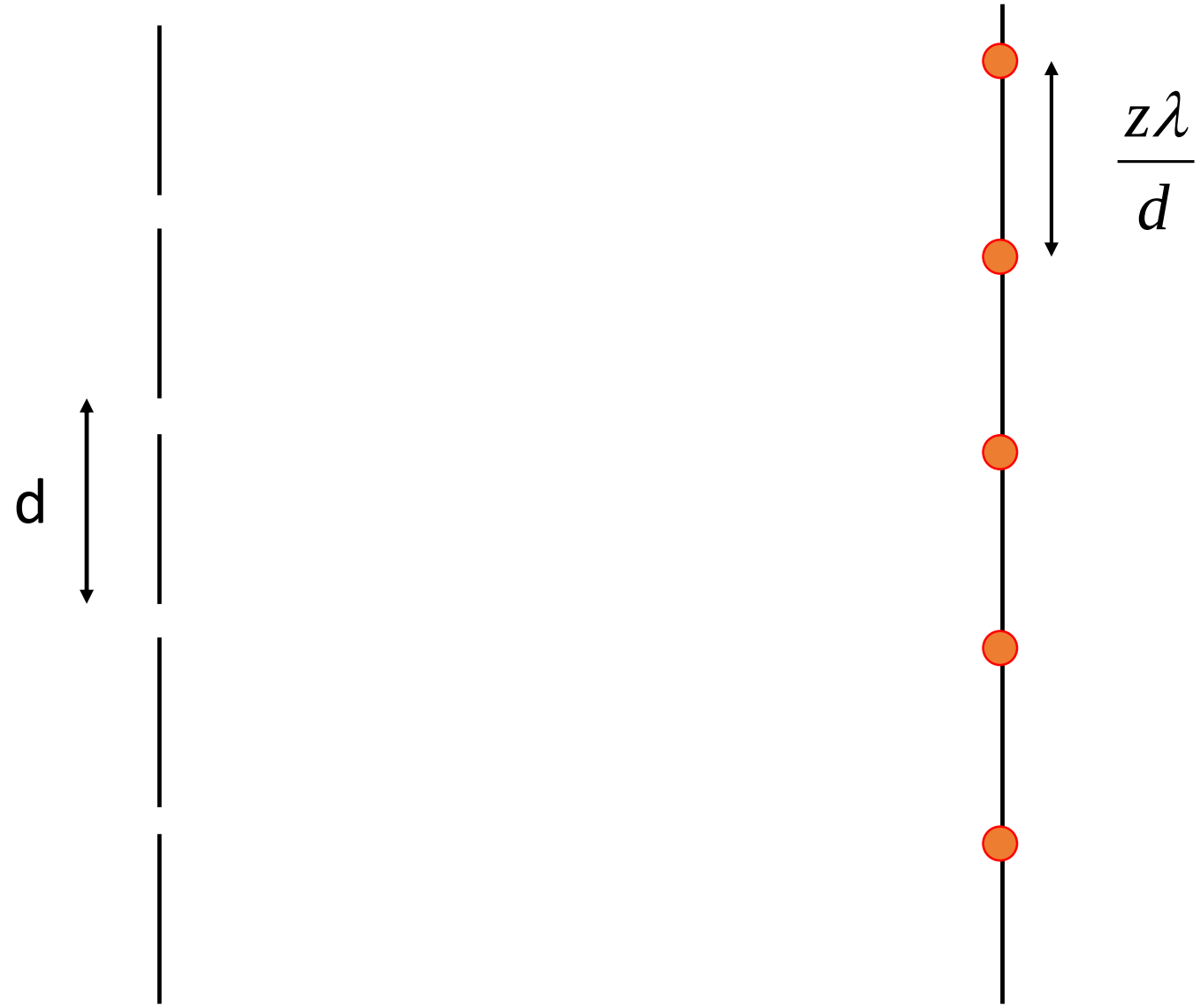
$$F(\theta) = \int_{-\infty}^{\infty} f(x) e^{-j\frac{2\pi}{\lambda} x \sin\theta} dx$$

$$F(\theta) = \int_{-\infty}^{\infty} f(x) e^{-j\frac{2\pi}{\lambda} x\theta} dx$$

$$\omega = \frac{2\pi\theta}{\lambda}$$

$$F(\omega) = \int_{-\infty}^{\infty} f(x) e^{-j\omega x} dx$$

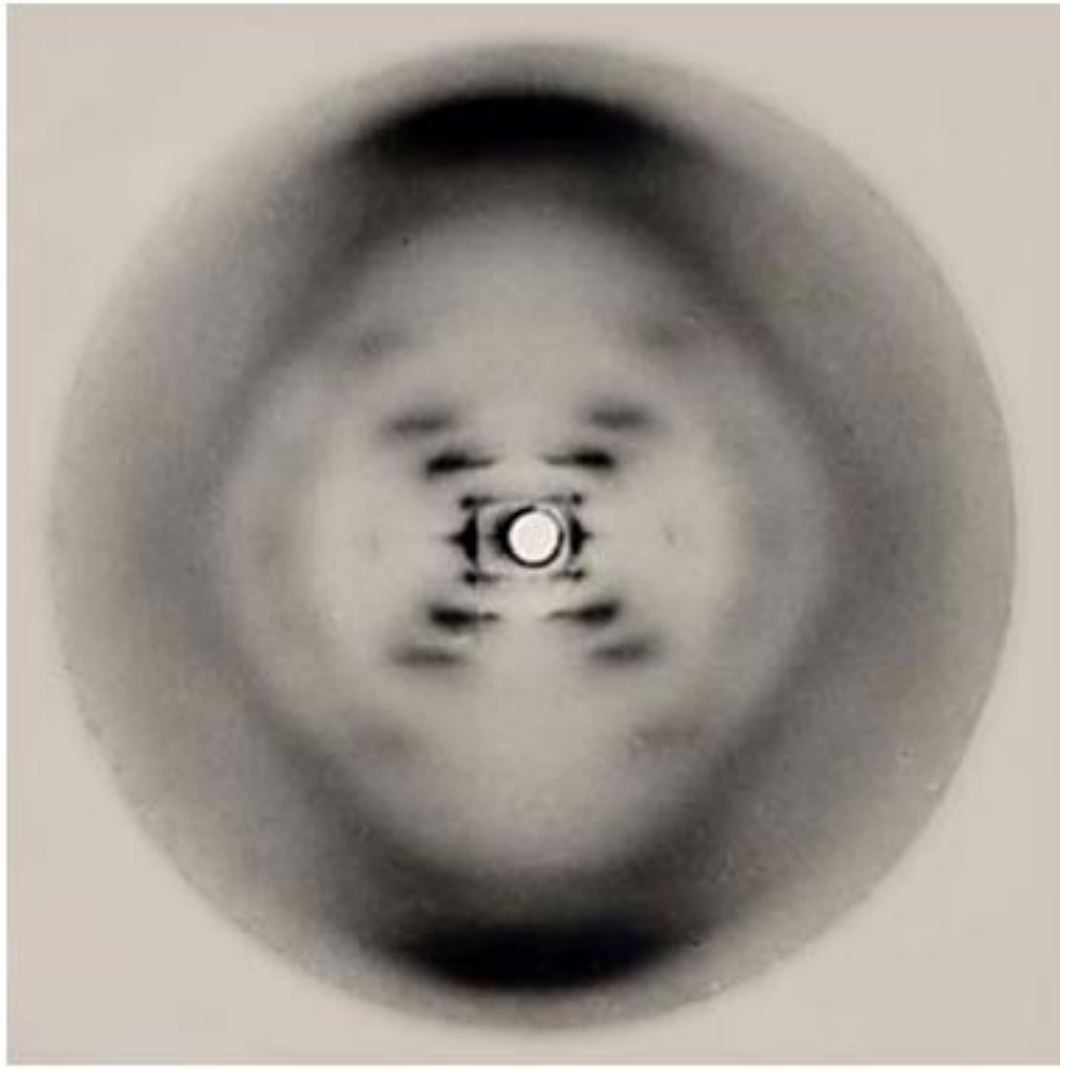
Diffraction (Fraunhofer)



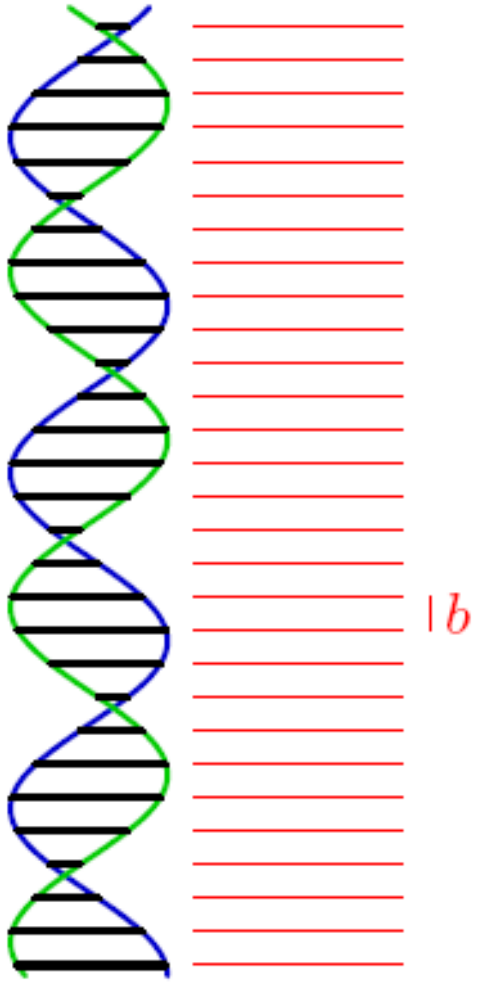
Halftone dots noise

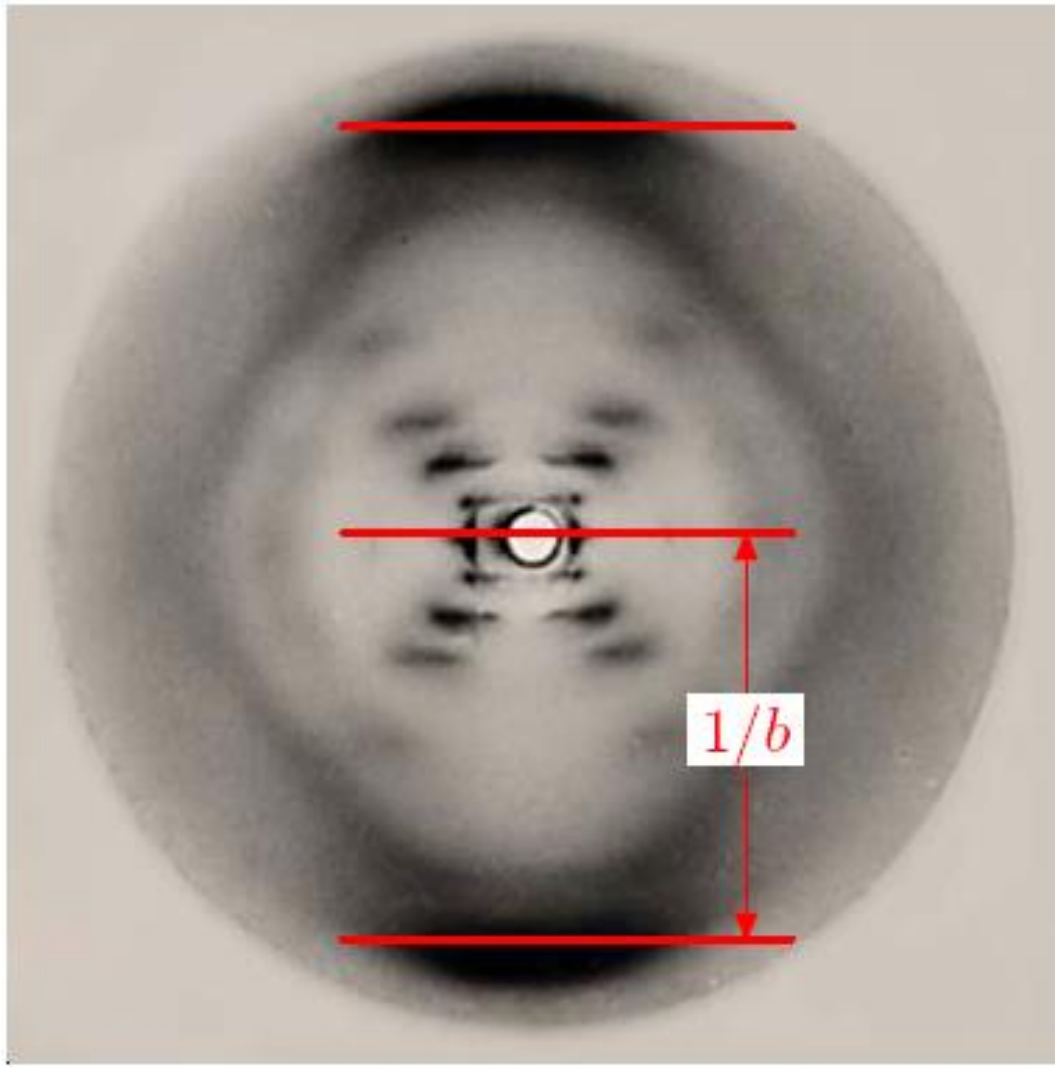
Optical Low pass filter

Rosalind Franklin Image of double helix

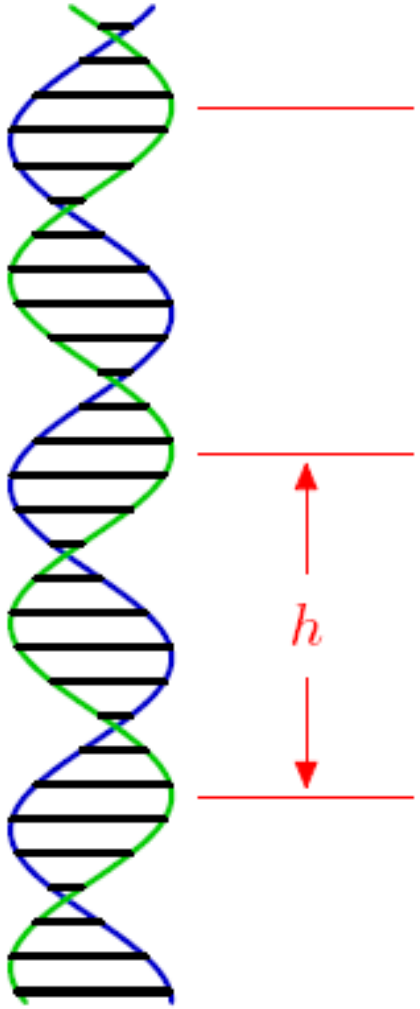


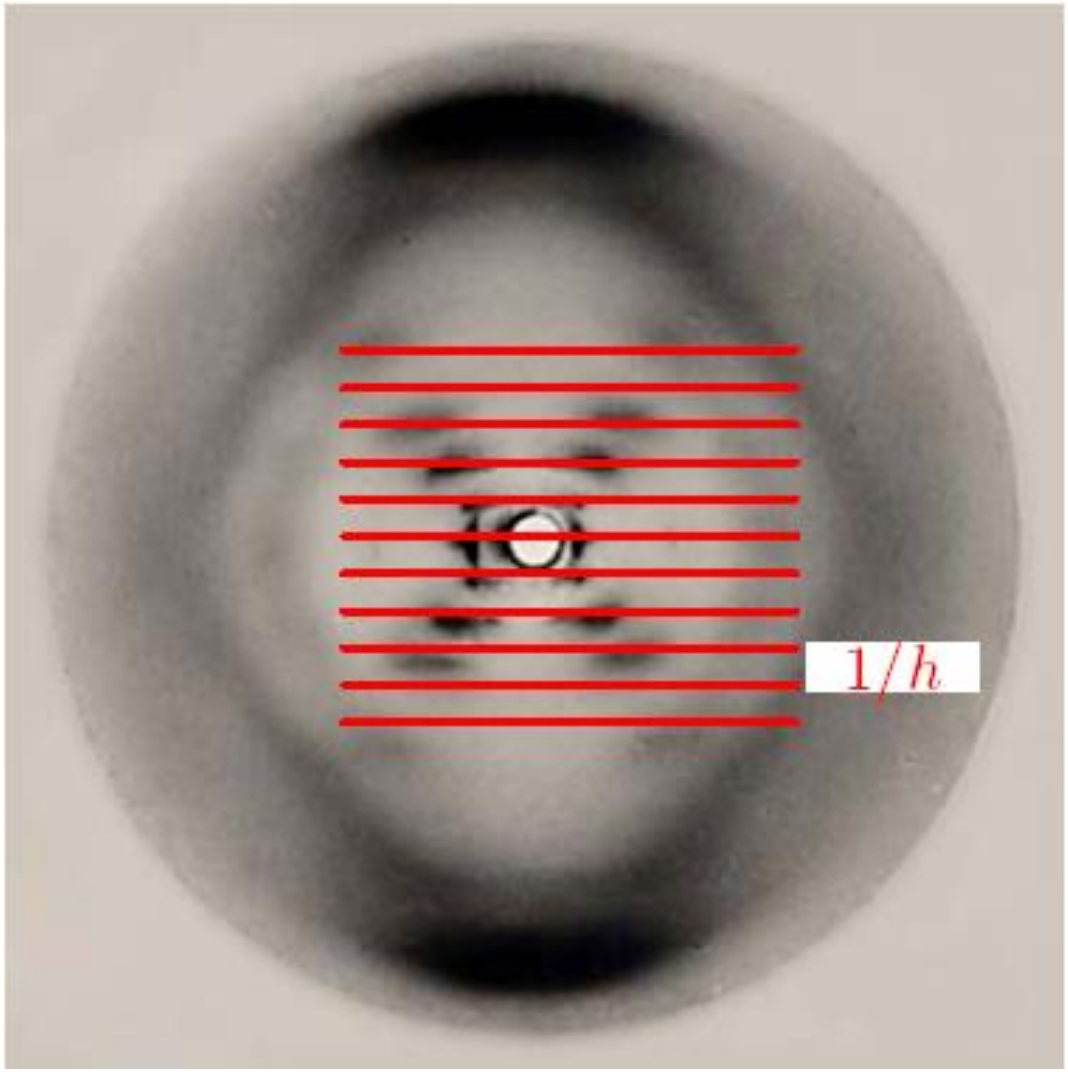
Rosalind Franklin Image of double helix





Rosalind Franklin Image of double helix





Rosalind Franklin Image of double helix