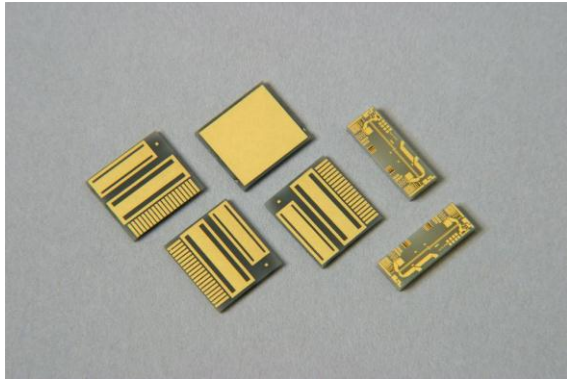


The Design and Construction of an Interferometer System for the Study of Thin Metal Films

Tyler Reynolds, Brandon Hoffman
Houghton College

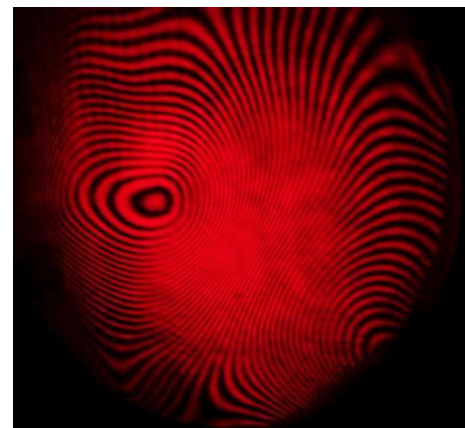
Outline



w30.indonetwork.co.id

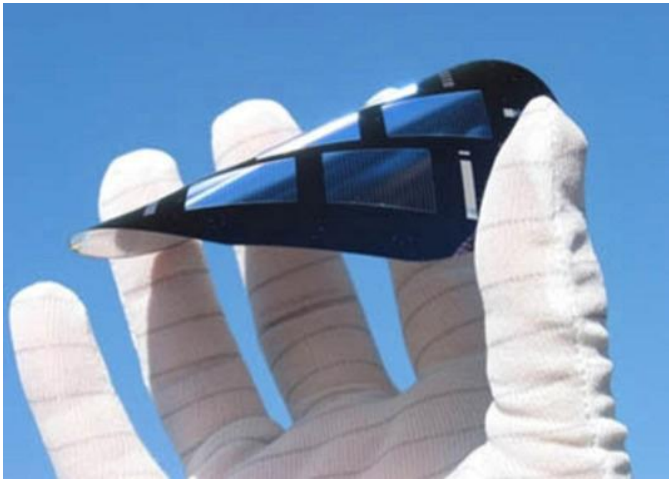


scienceclarified.com

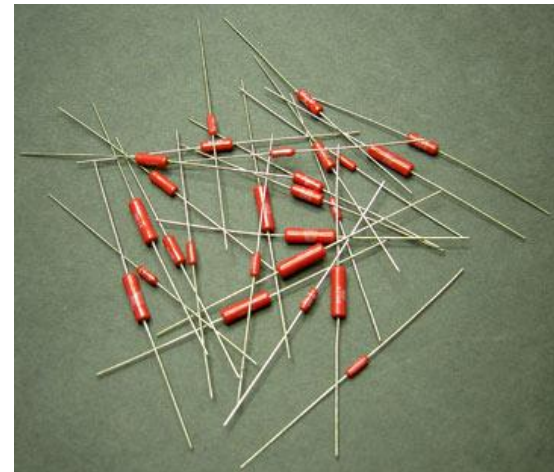


Thin Films

- Optics
- Electronics
- Decoration

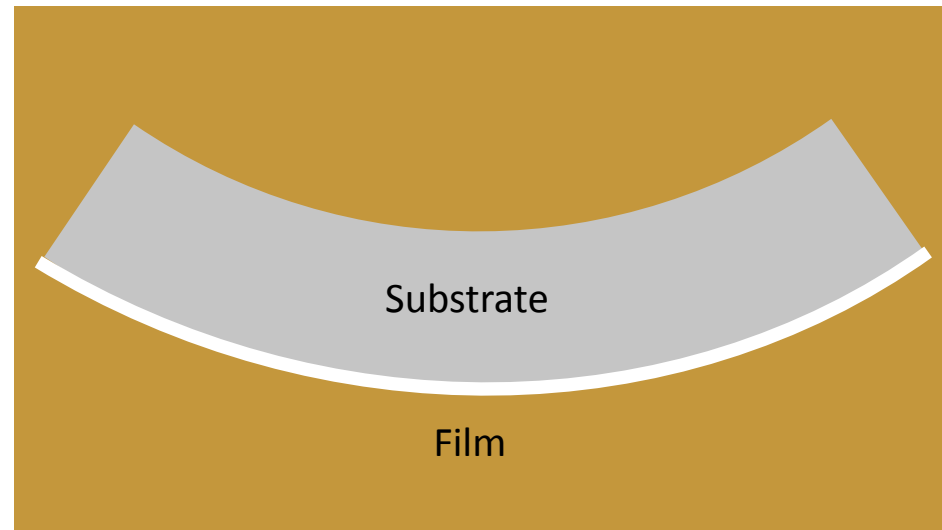


inhabitat.com



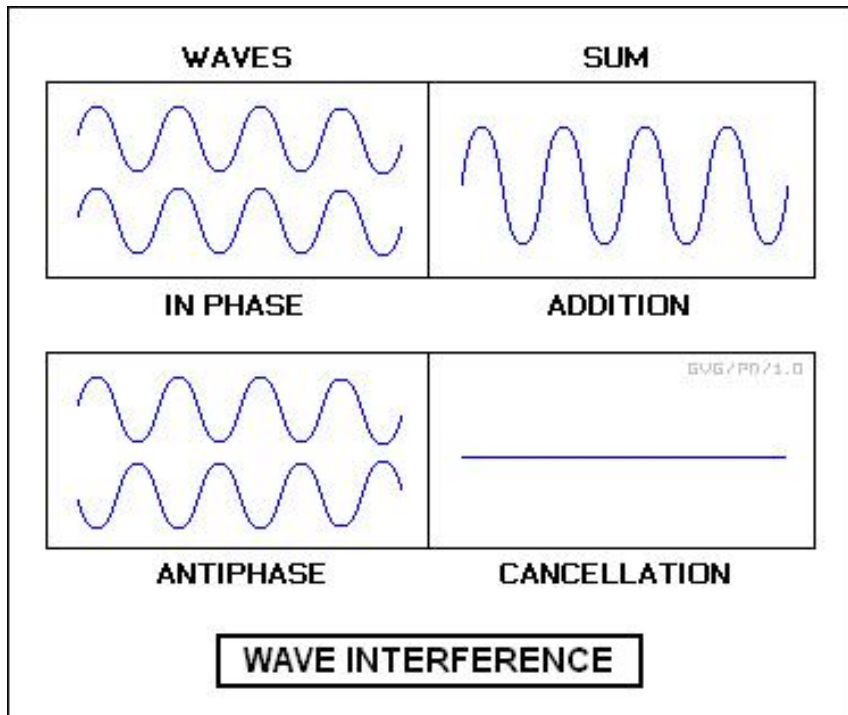
partsconnexion.com

Heat and Curvature

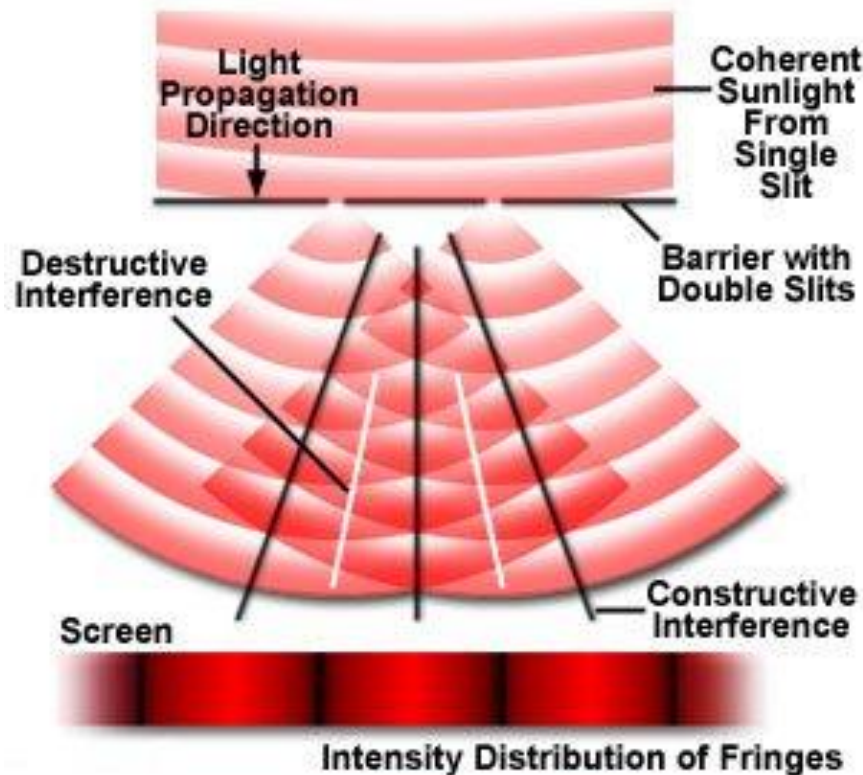


$$\sigma_{avg} = \frac{\kappa M_s h_s^2}{6h_f}.$$

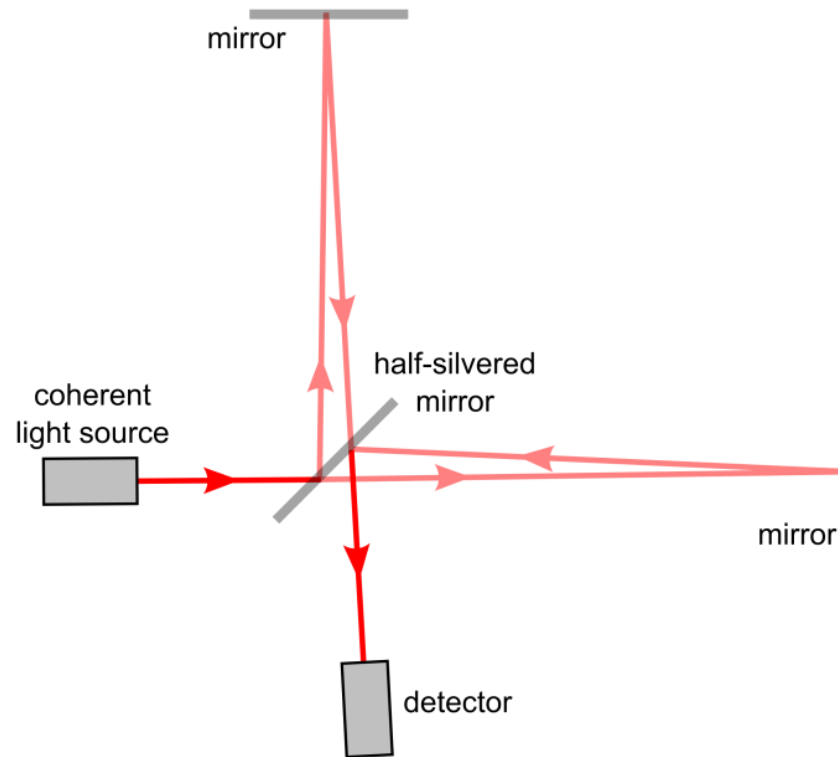
Waves and Interference



Example: Young's Double-Slit Experiment

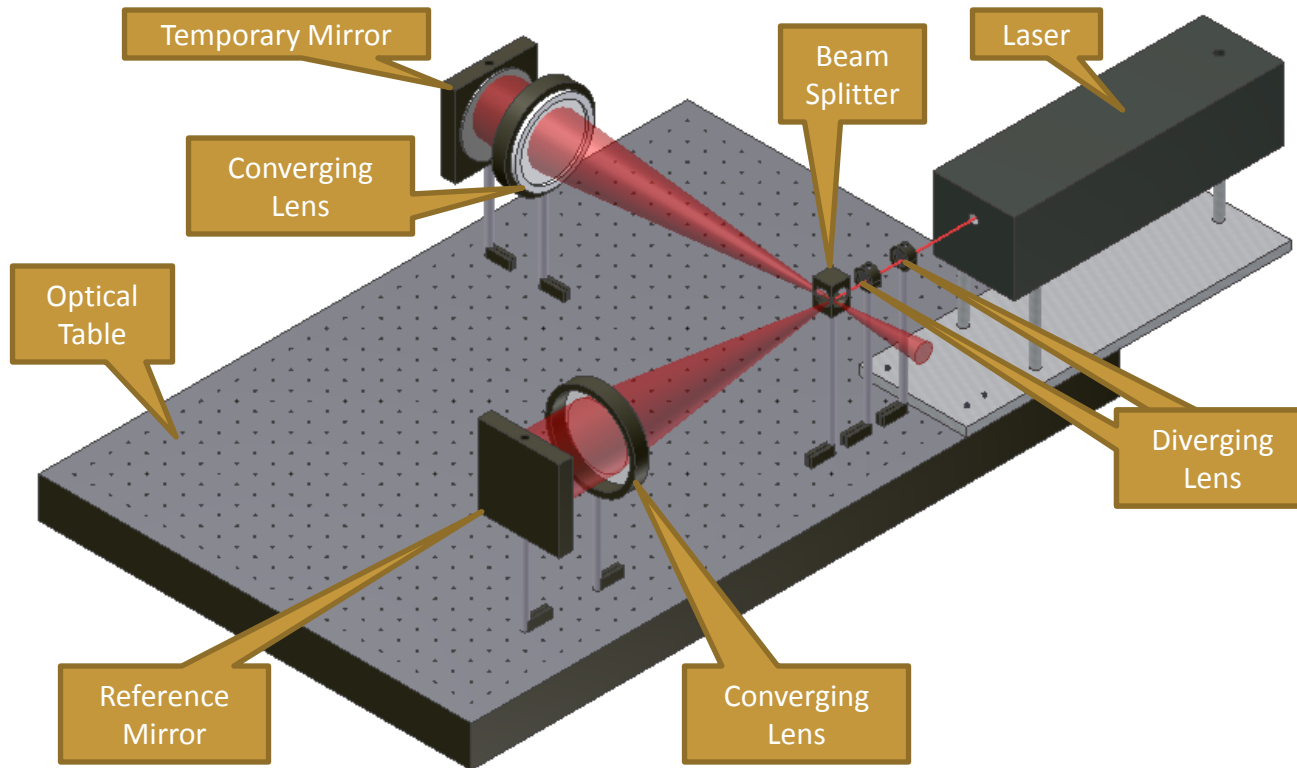


Michelson Interferometers

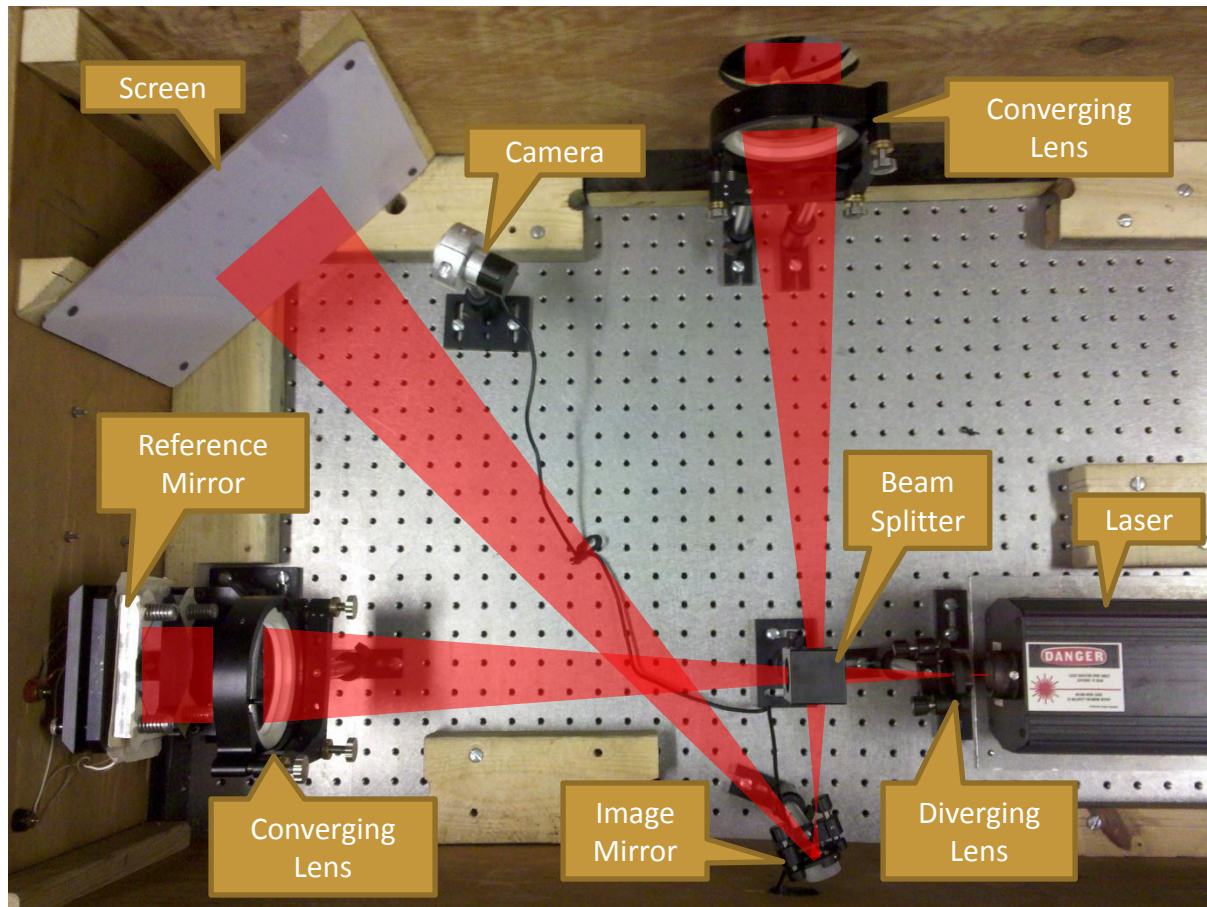


upload.wikimedia.org

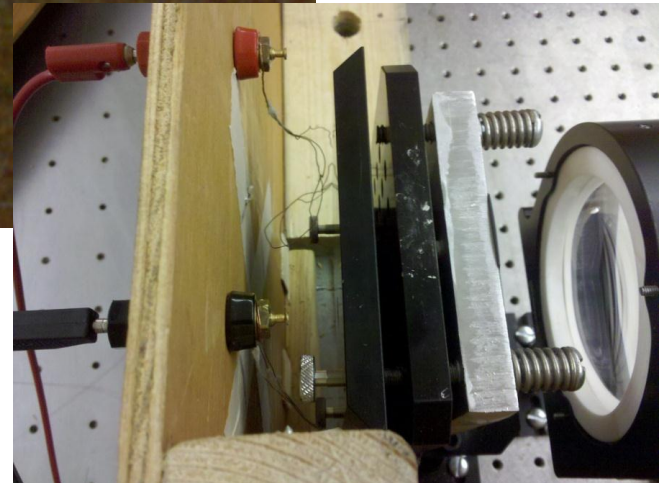
Our Interferometer



Our Interferometer



Piezoelectric Ceramics



Computer



Power
Supply



Op-Amp



Piezo

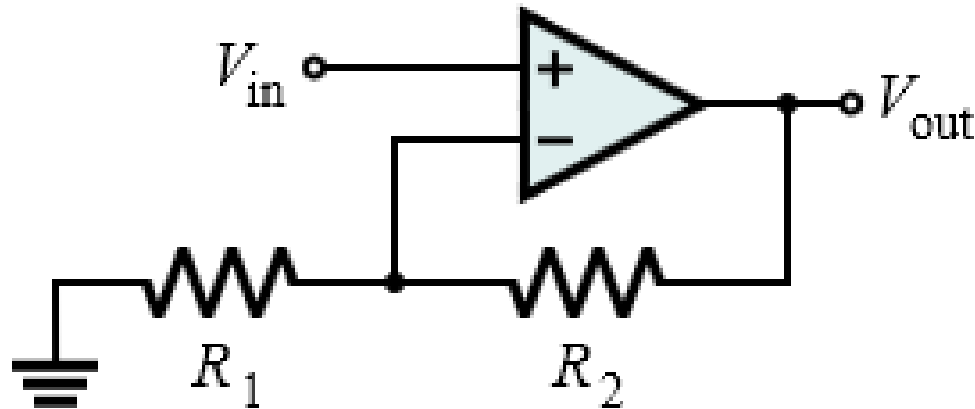
Outputs Triangle Wave
0 to 5 Volts

Shifts Wave
-2.5 to 2.5 Volts

Amplifies Wave
-30 to 30 Volts

Moves Mirror

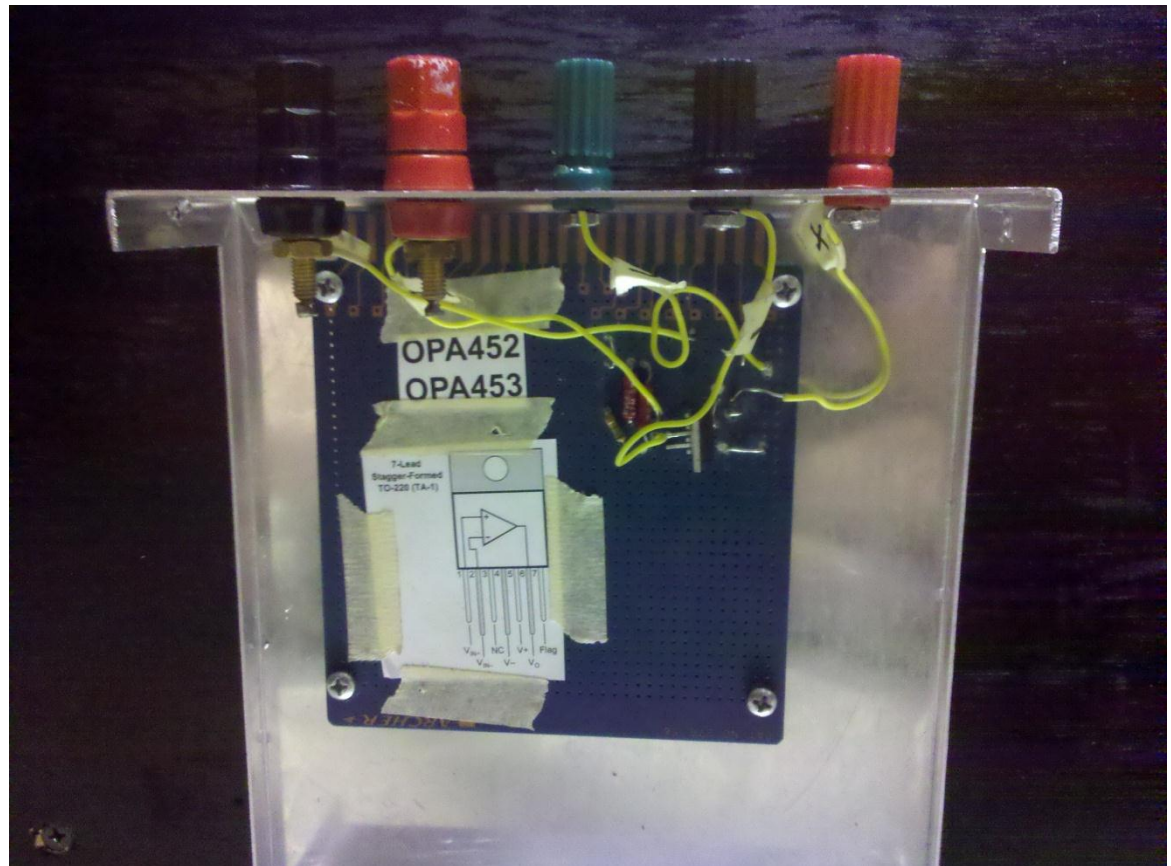
Non-inverting Op-Amp Circuit



upload.wikimedia.org

$$V_{out} = V_{in} \left(1 + \frac{R_2}{R_1} \right)$$

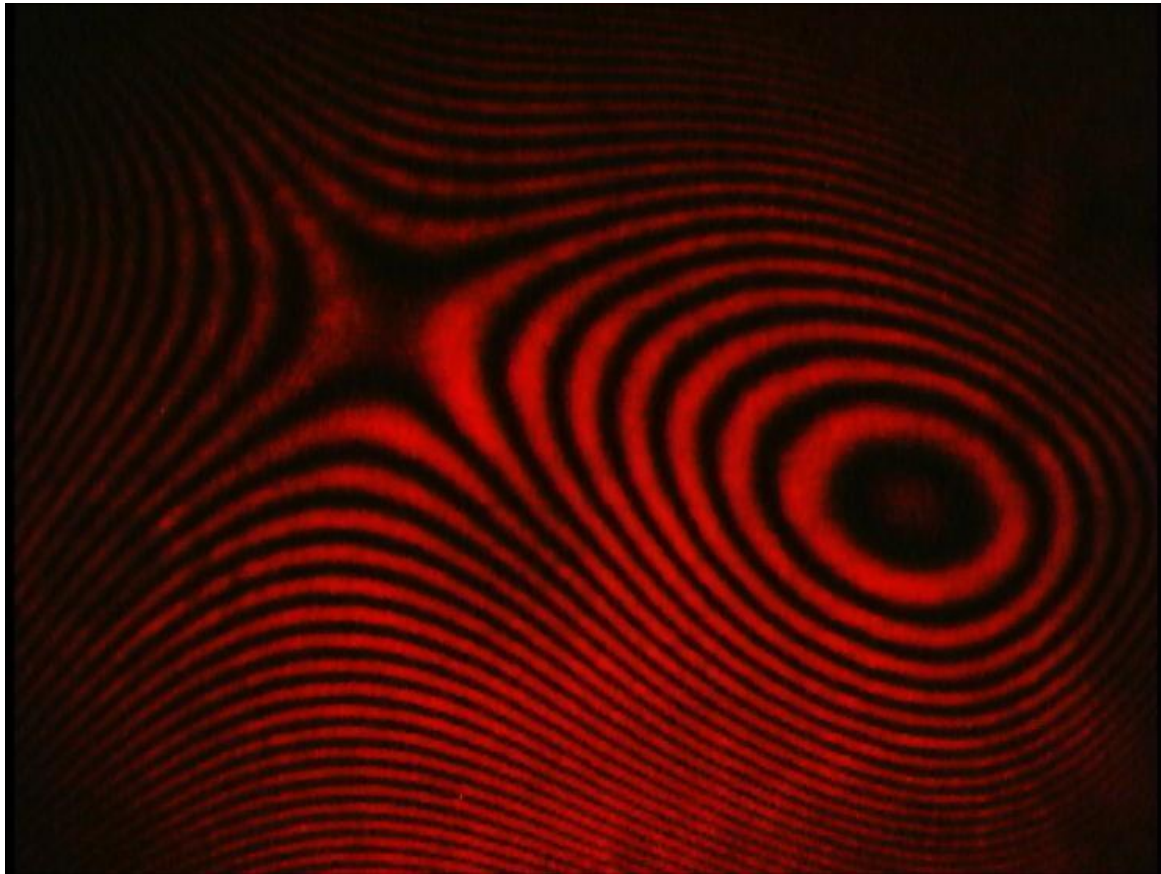
Non-inverting Op-Amp Circuit

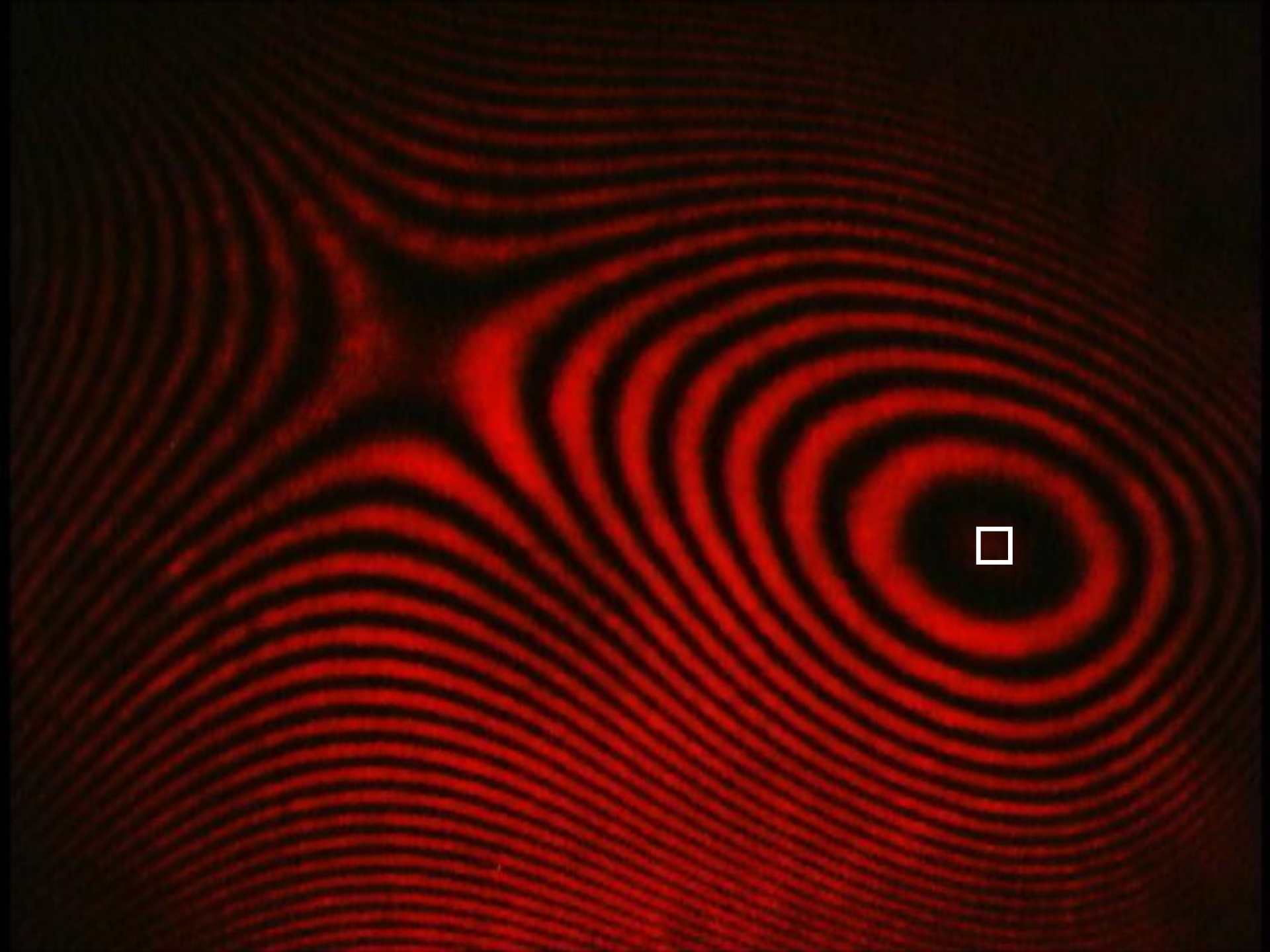


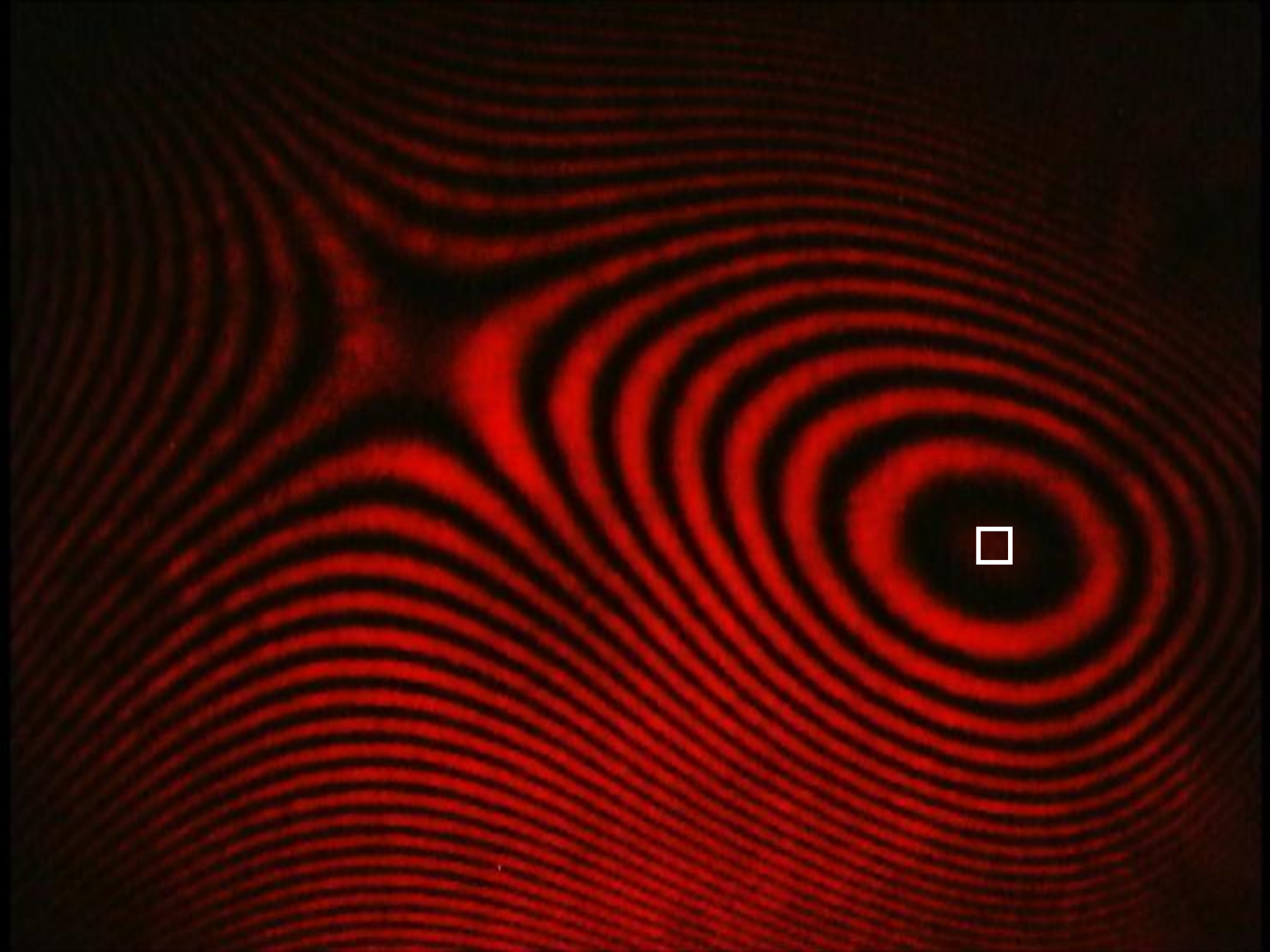
Non-inverting Op-Amp Circuit

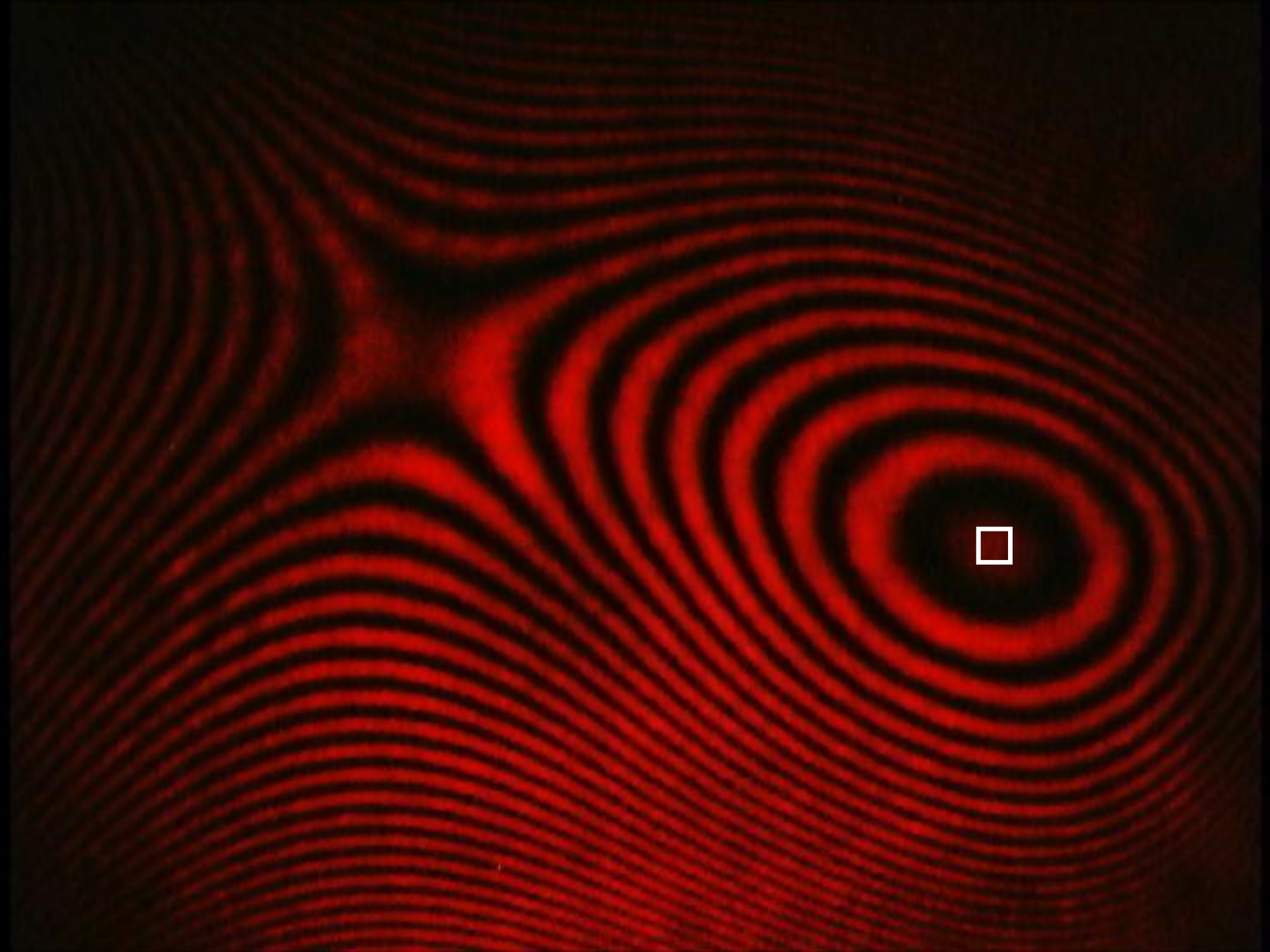


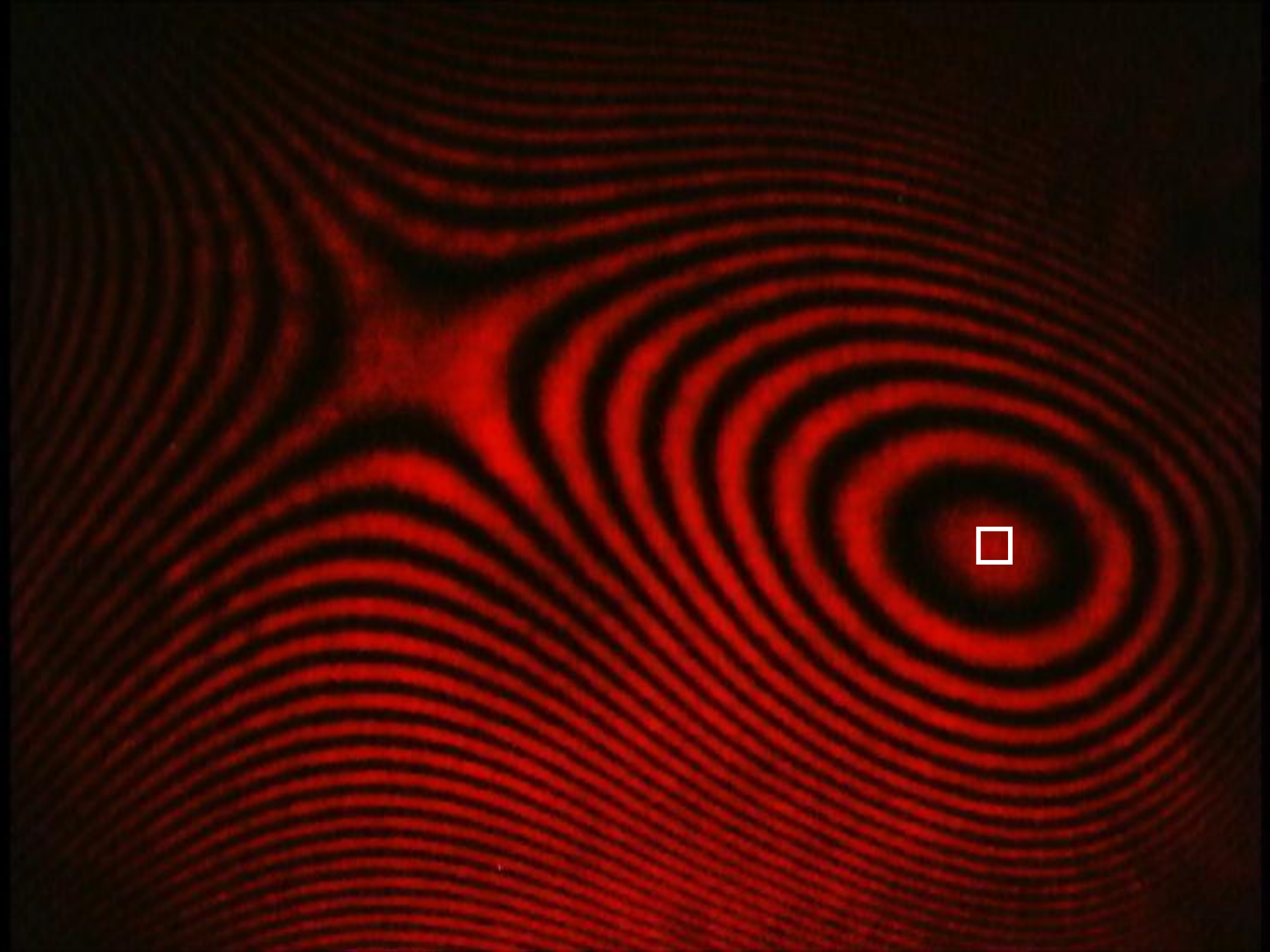
Interference Pattern

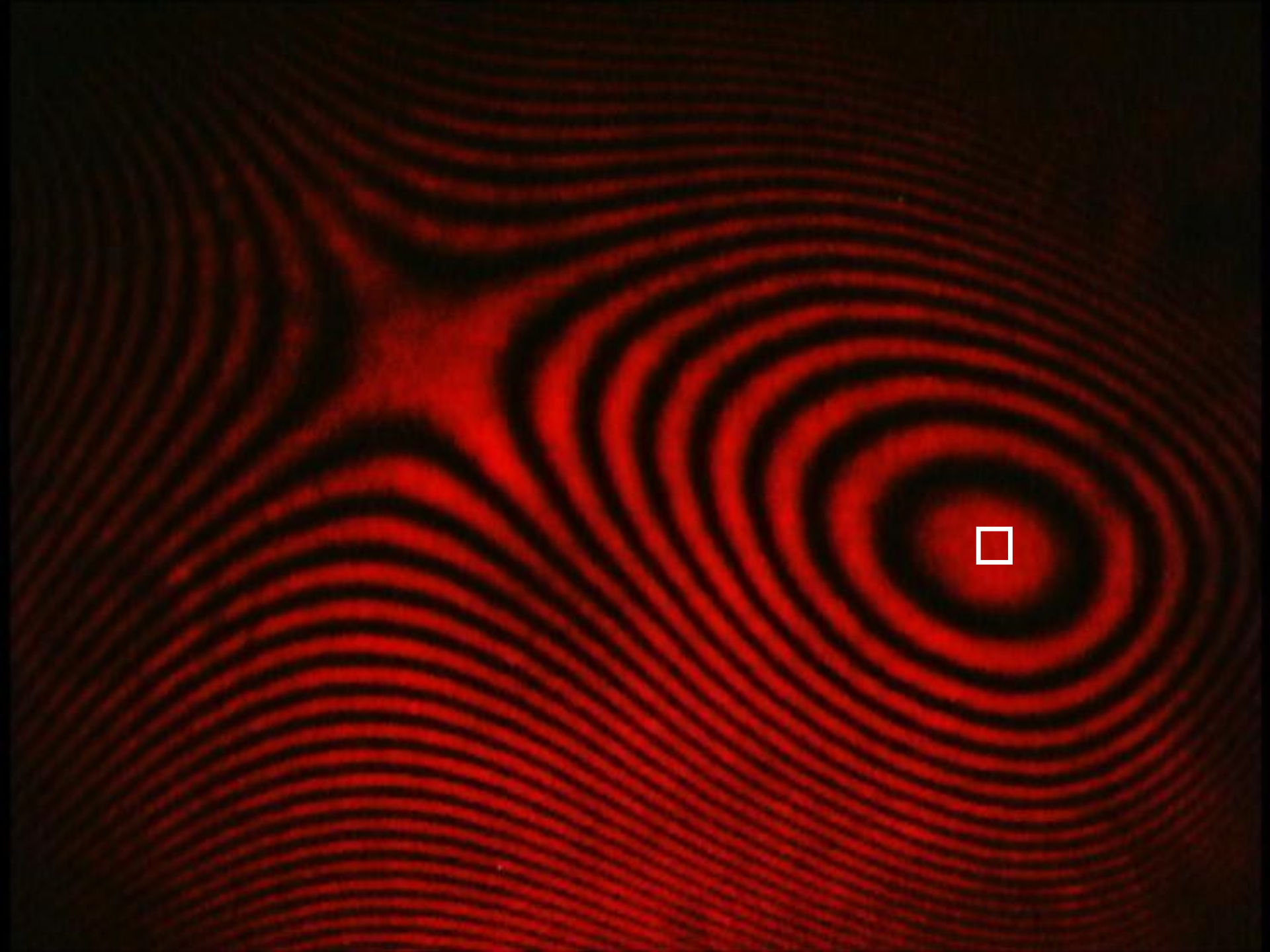


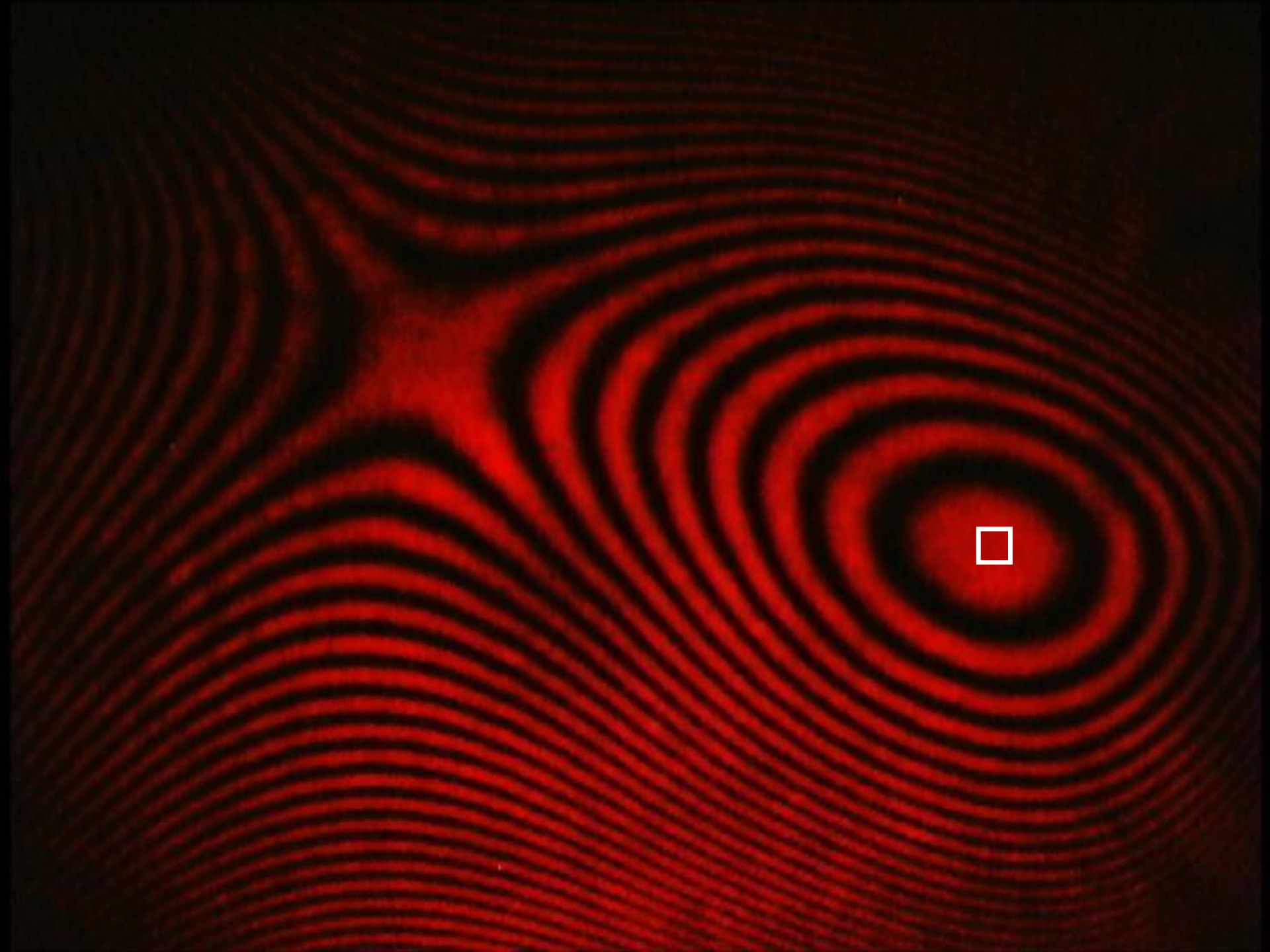


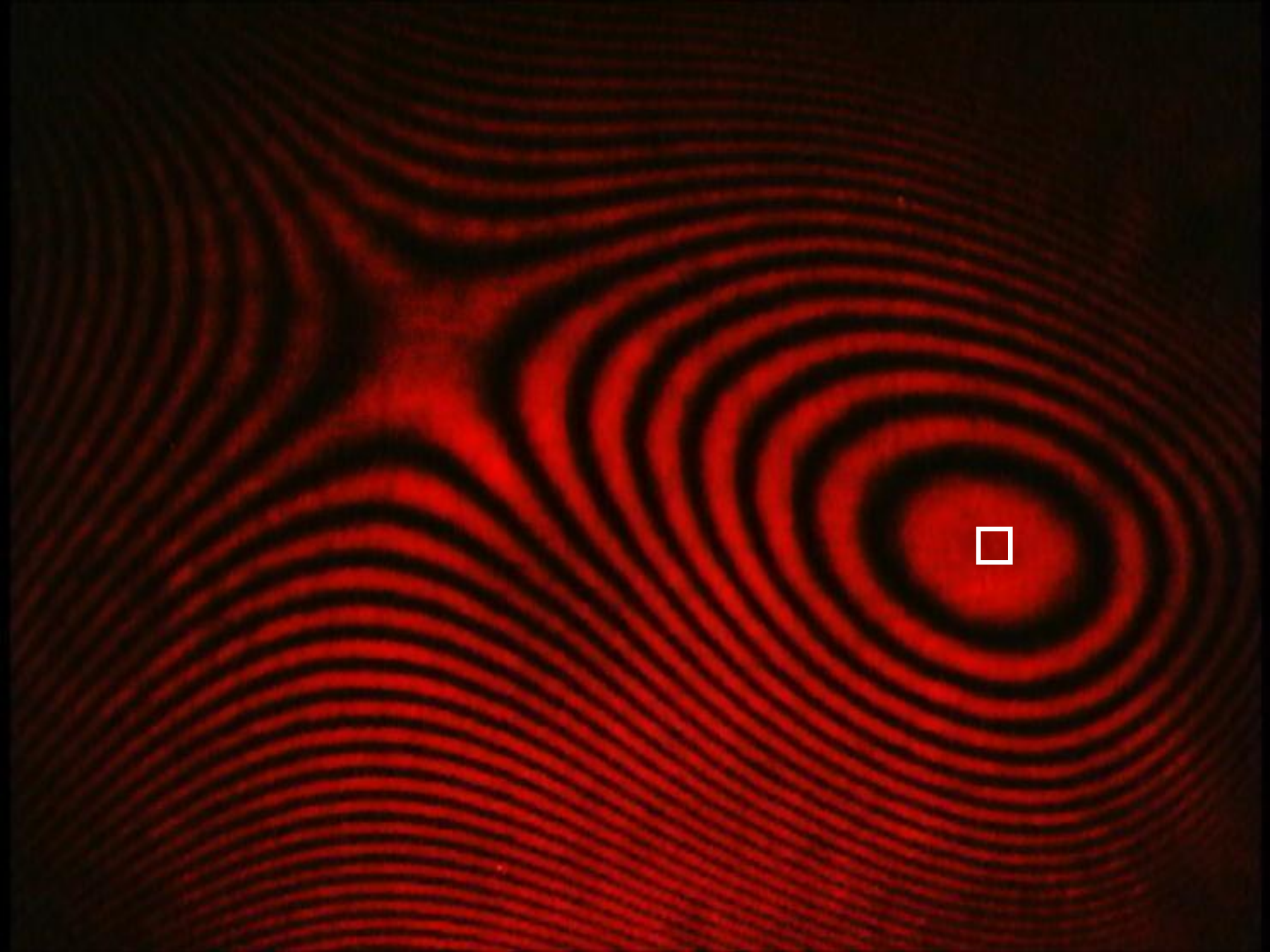




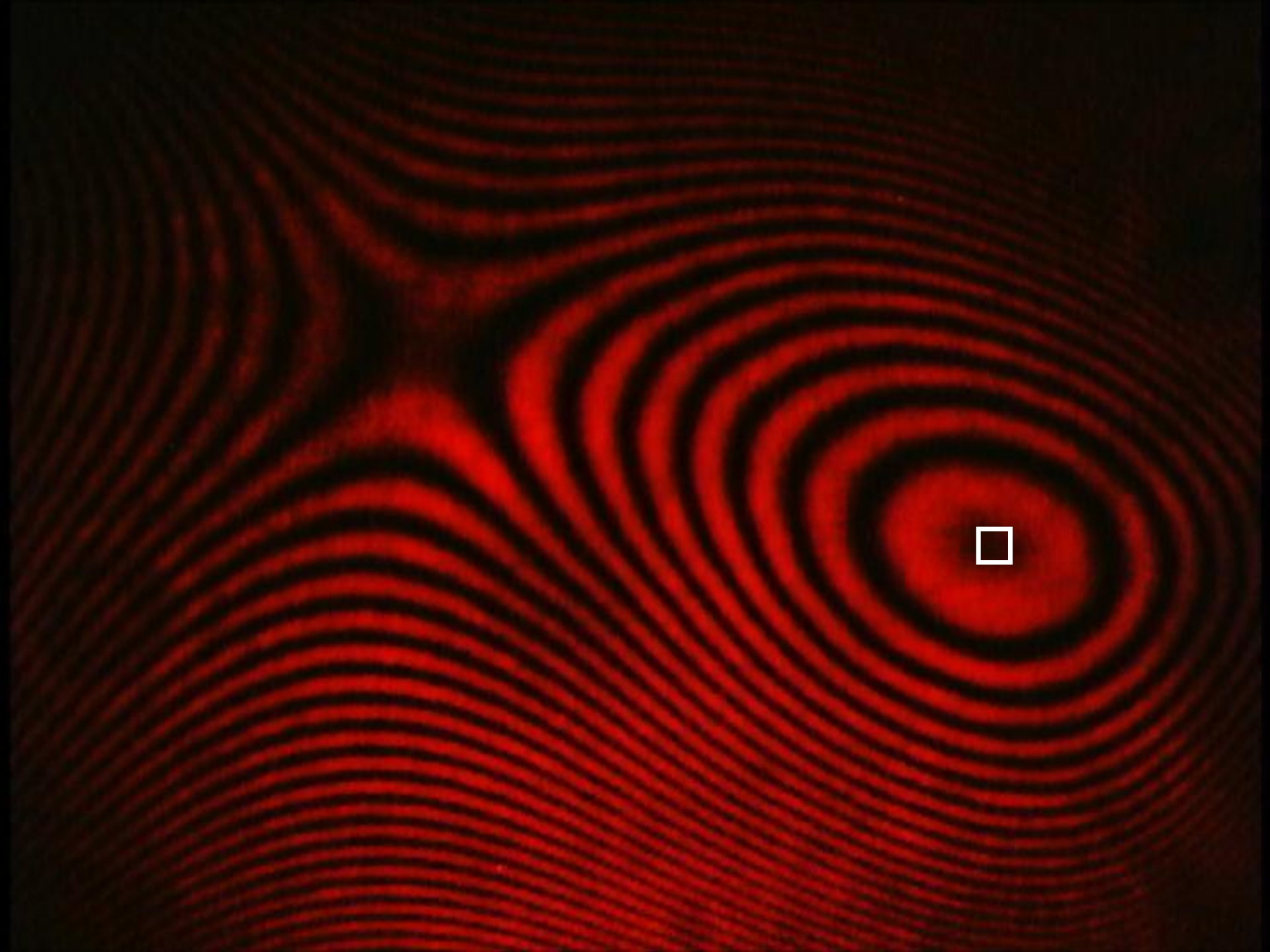


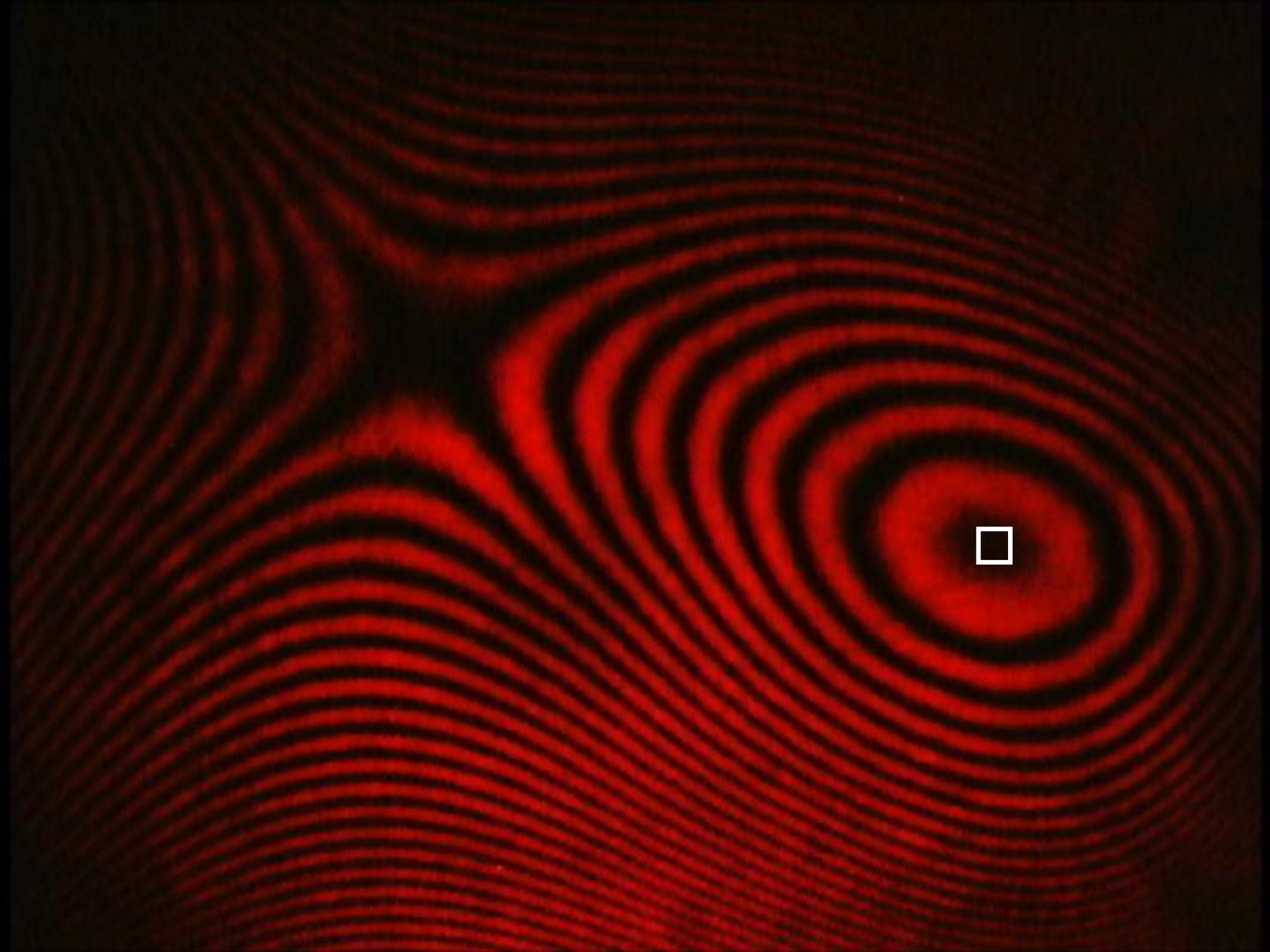












Intensity vs. Position

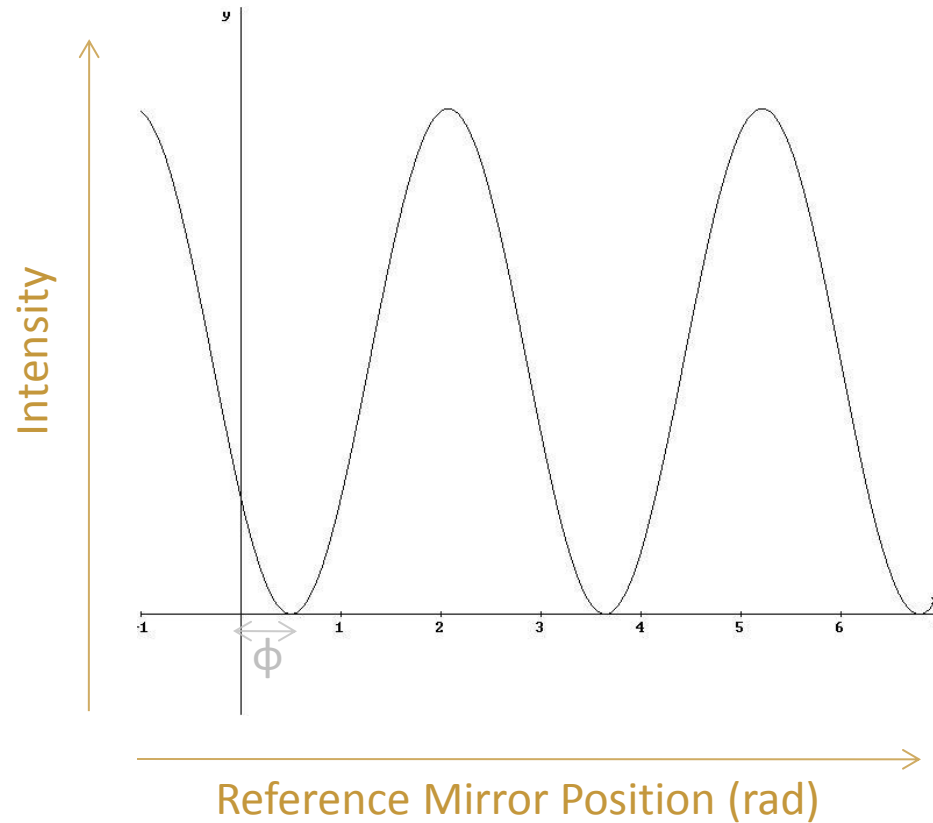
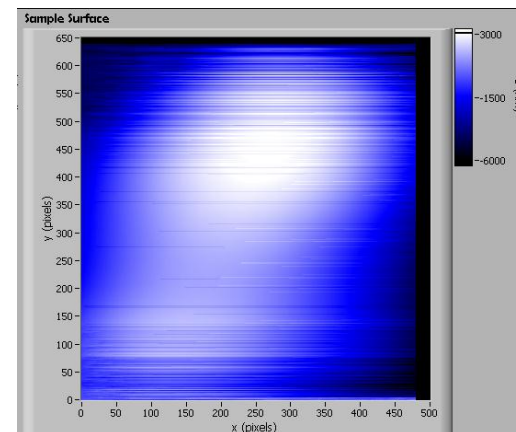
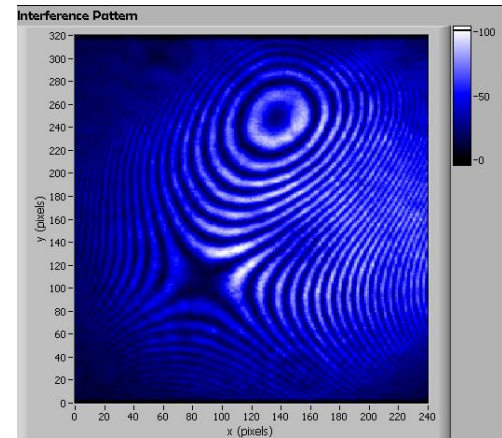
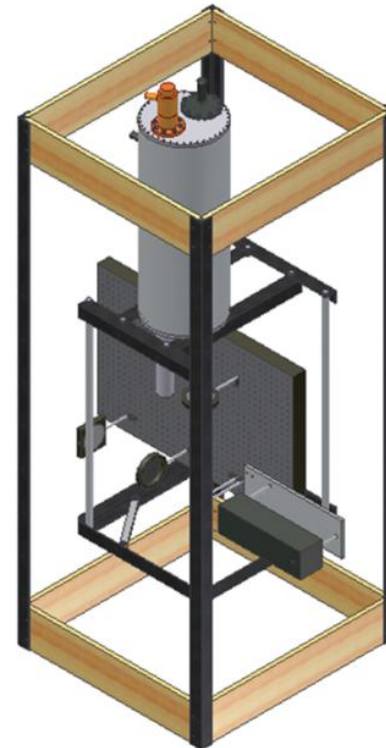


Image Processing



Deposition Chamber



Questions?

