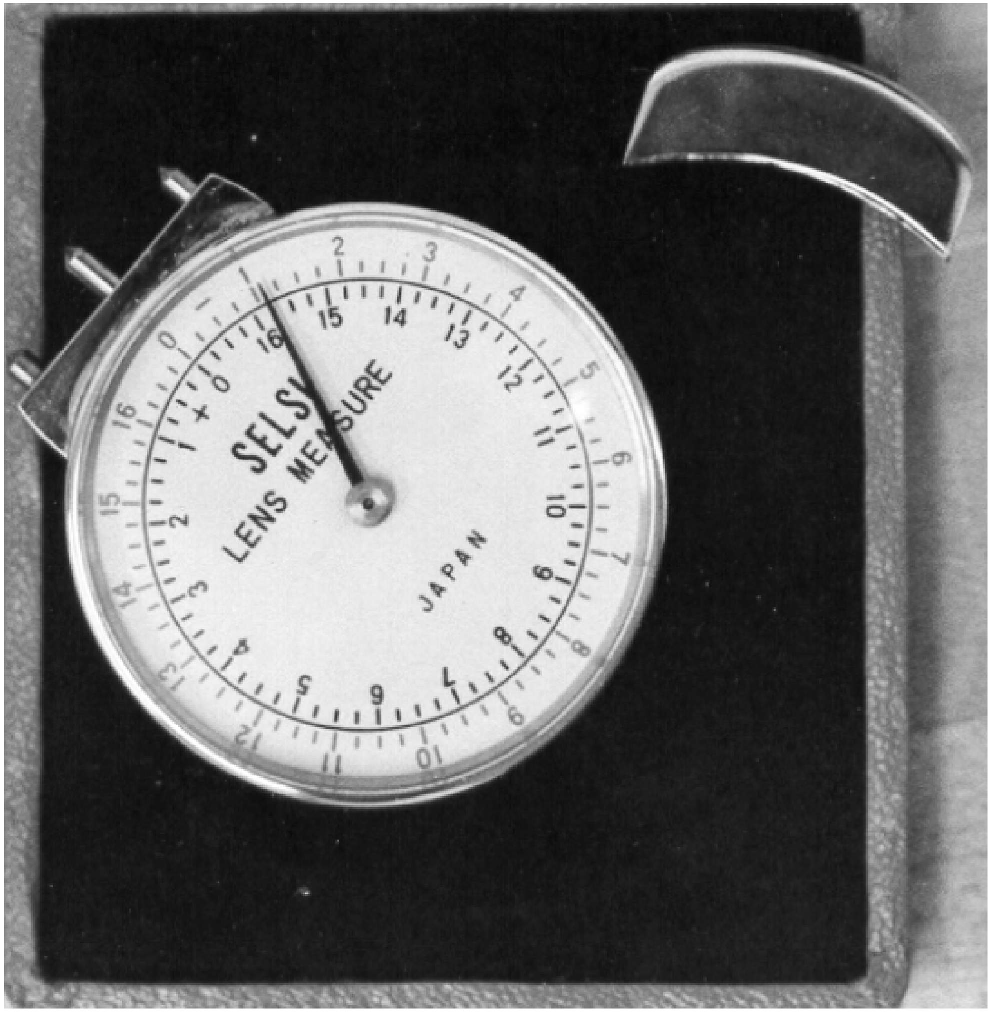
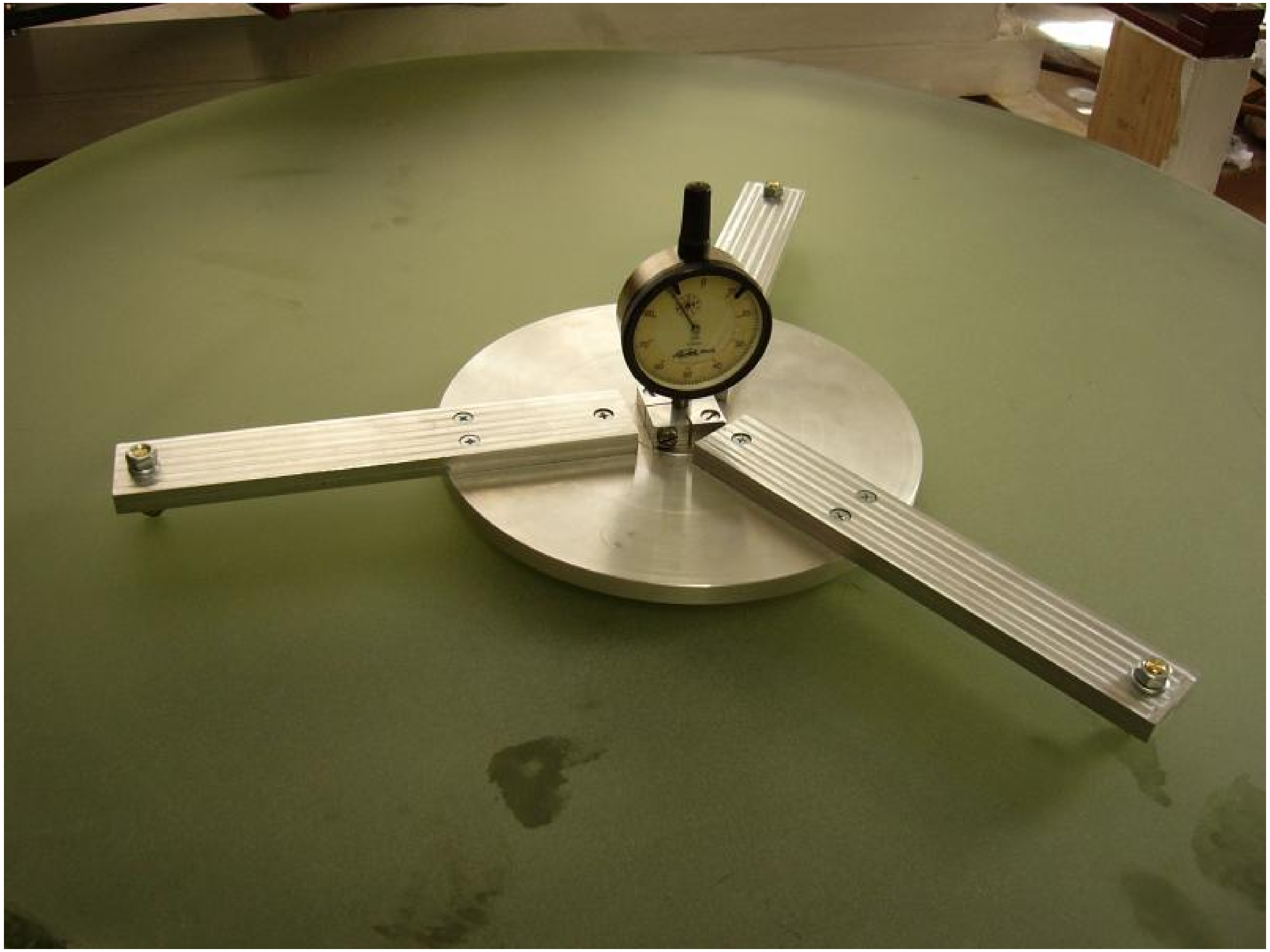
Section 3.1.1 – Geneva Gauge

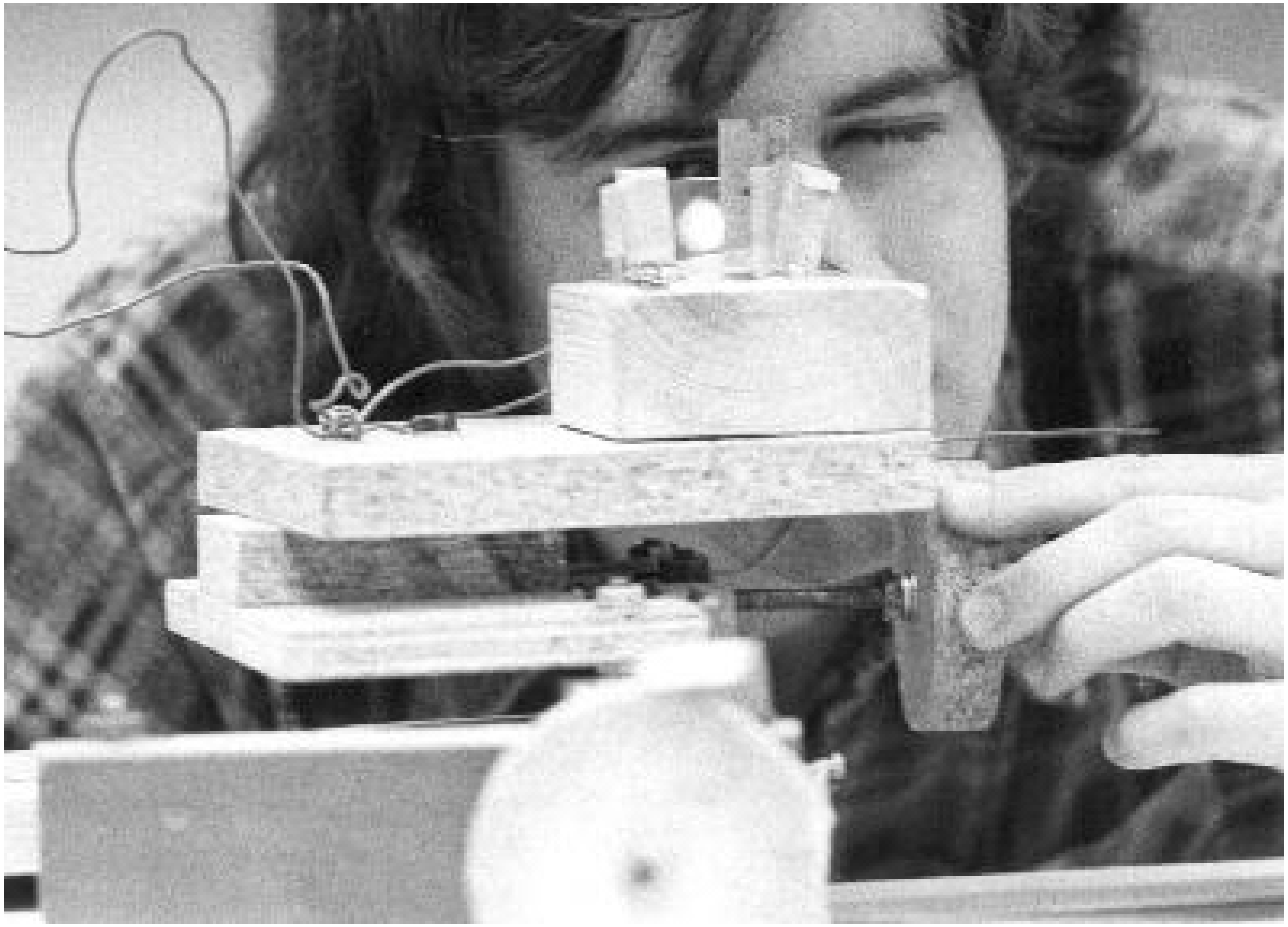


Section 3.1.2 - Spherometer



lcao.co.za

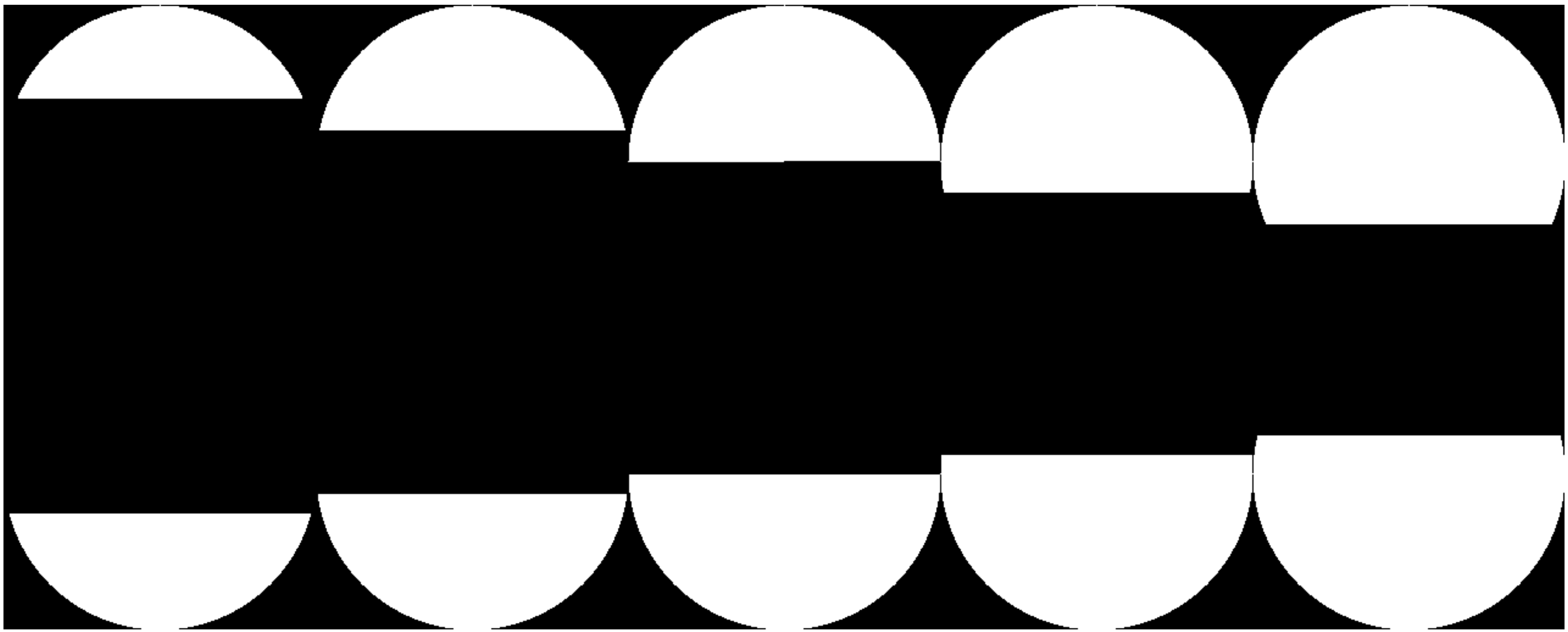
Section 3.2.1 – Foucault Test



home.moravian.edu

3.2.1 Knife Edge: Astigmatism

Knife Position

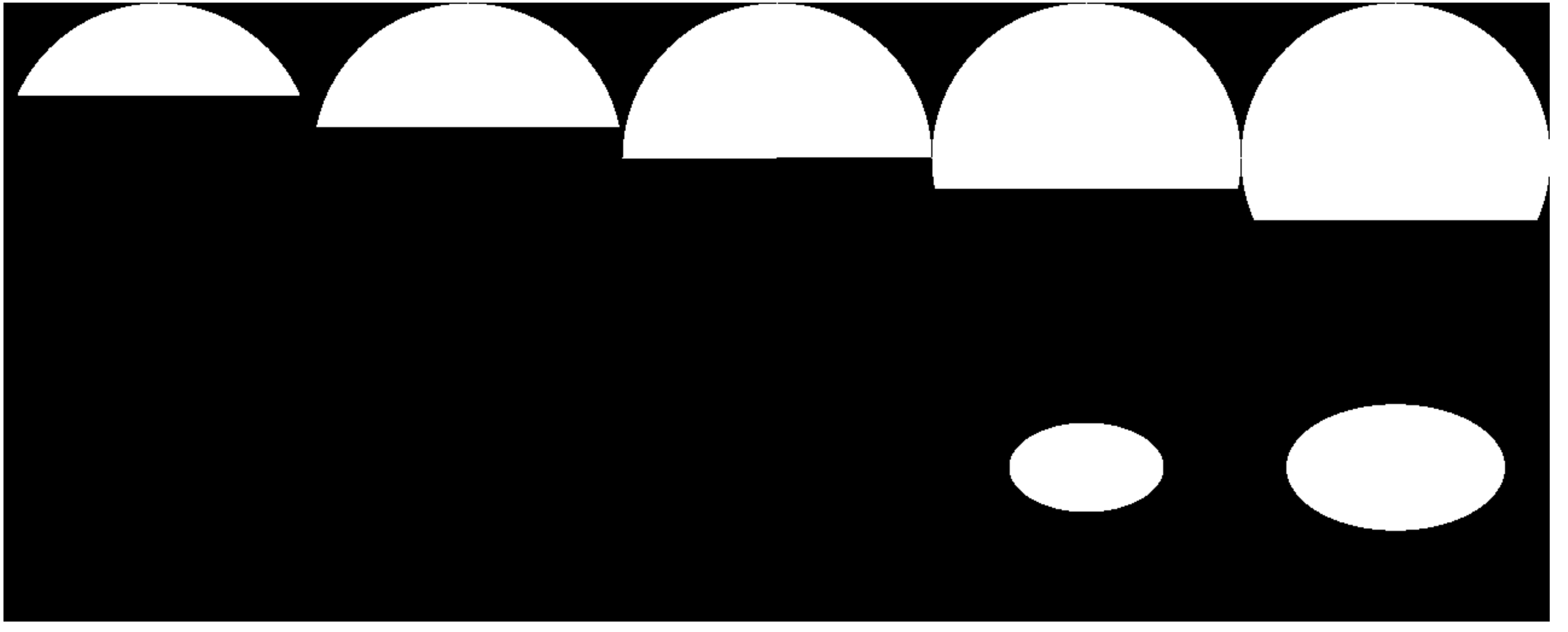


Pattern in Pupil

Inside Focus

3.2.1 Knife Edge: Coma

Knife Position



Pattern in Pupil

Inside Focus

3.2.1 Knife Edge: Coma

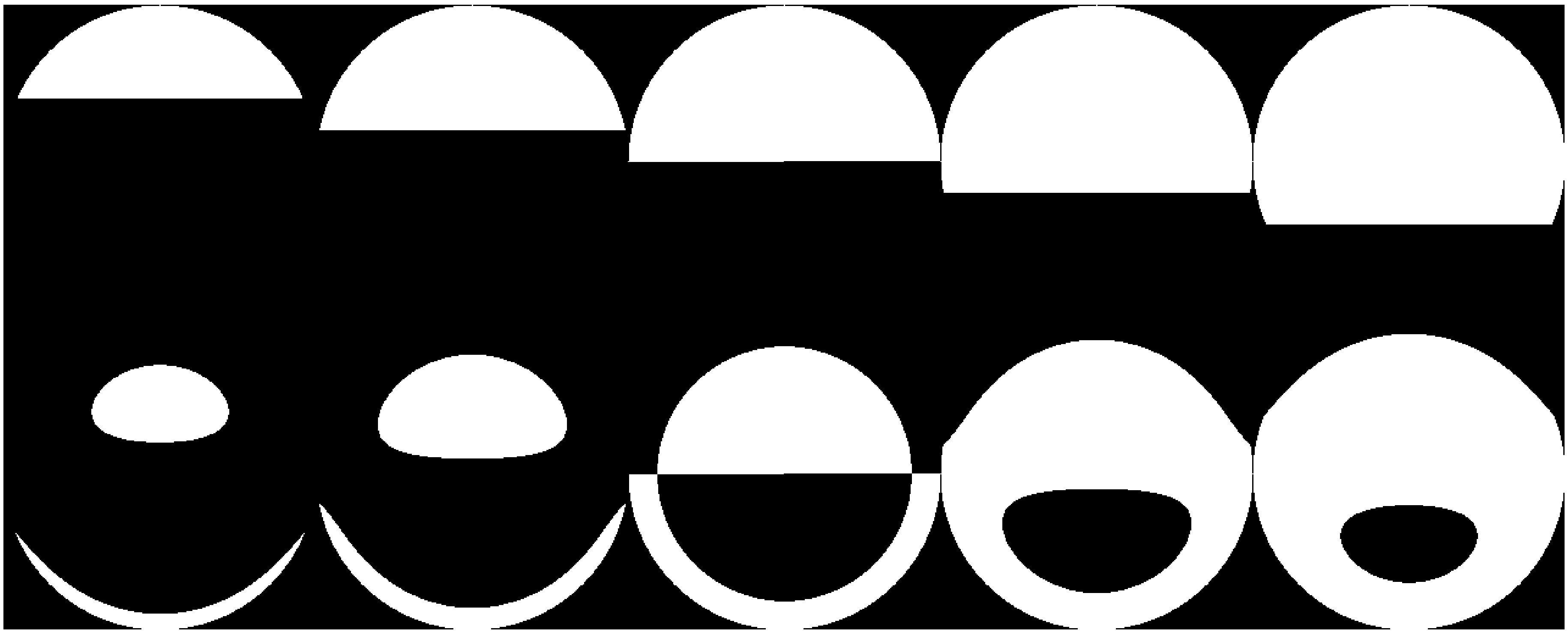
Knife Position

Pattern in Pupil

Inside Focus

3.2.1 Knife Edge: Spherical Aberration

Knife Position

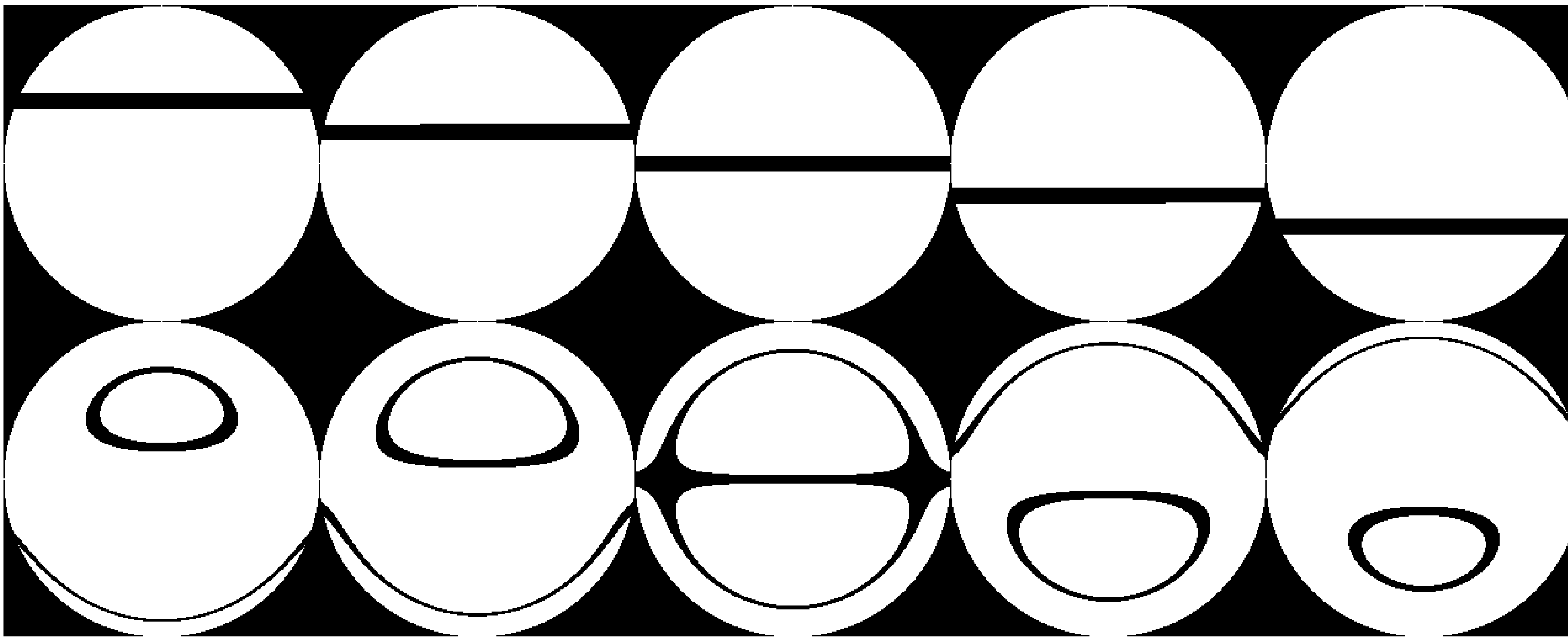


Pattern in Pupil

Inside Focus

3.2.2 Wire Test: Spherical Aberration

Wire Position



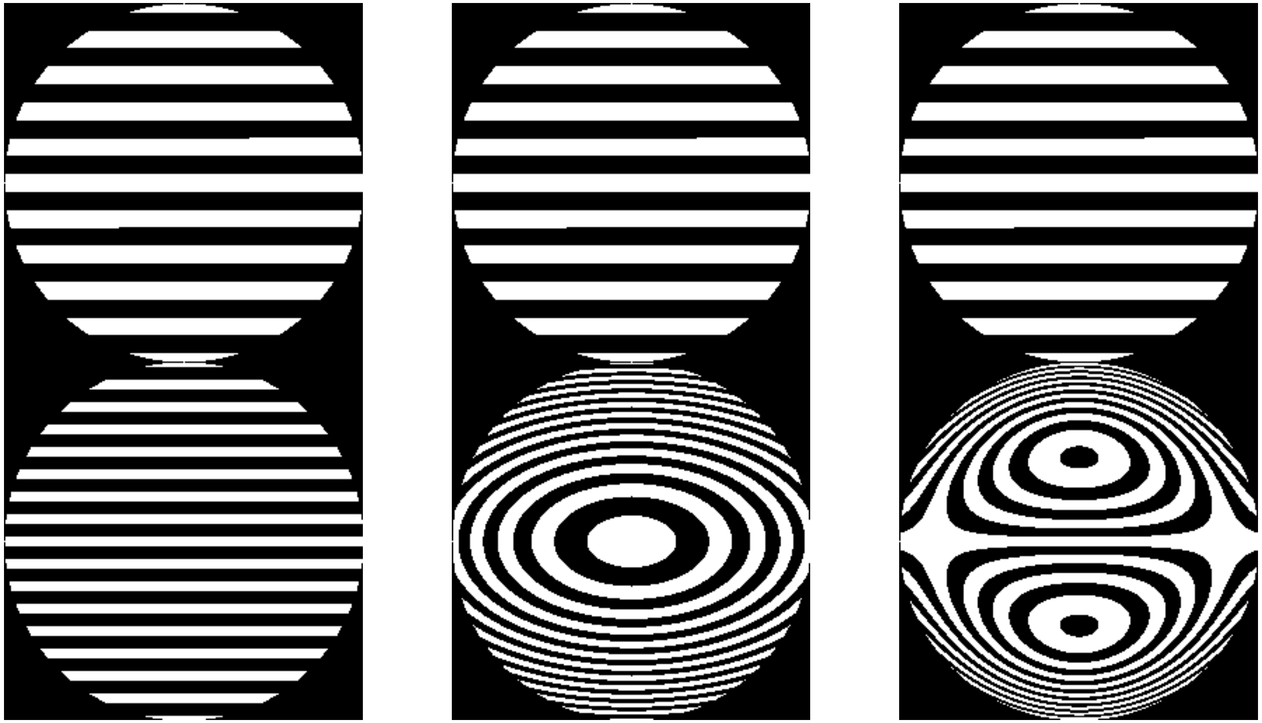
Pattern in Pupil

Inside Focus

3.2.3 Ronchi Test

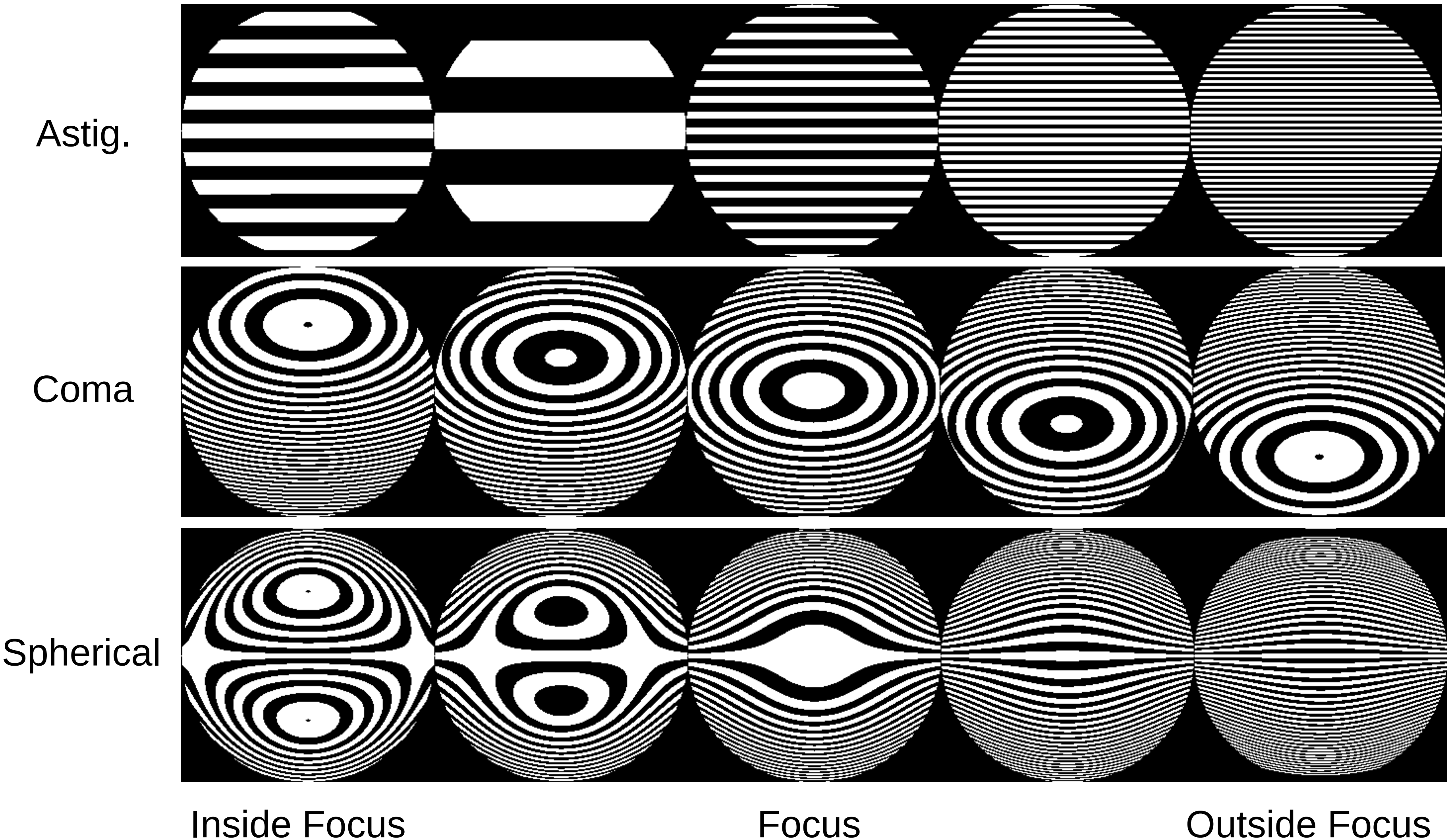
Ronchi Position

Pattern in Pupil



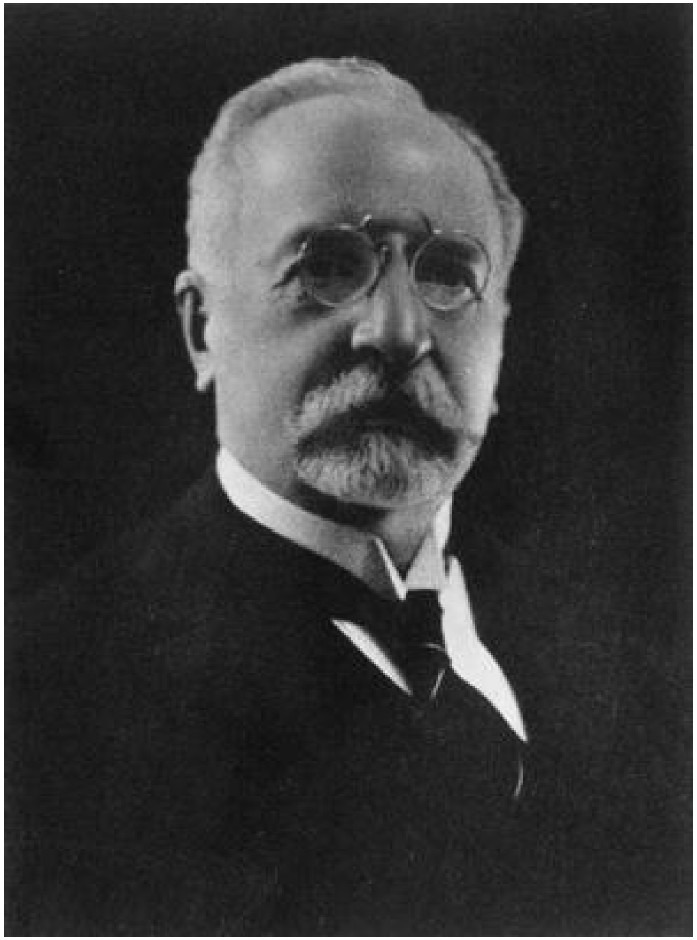
Inside Focus

3.2.3 Ronchi Test



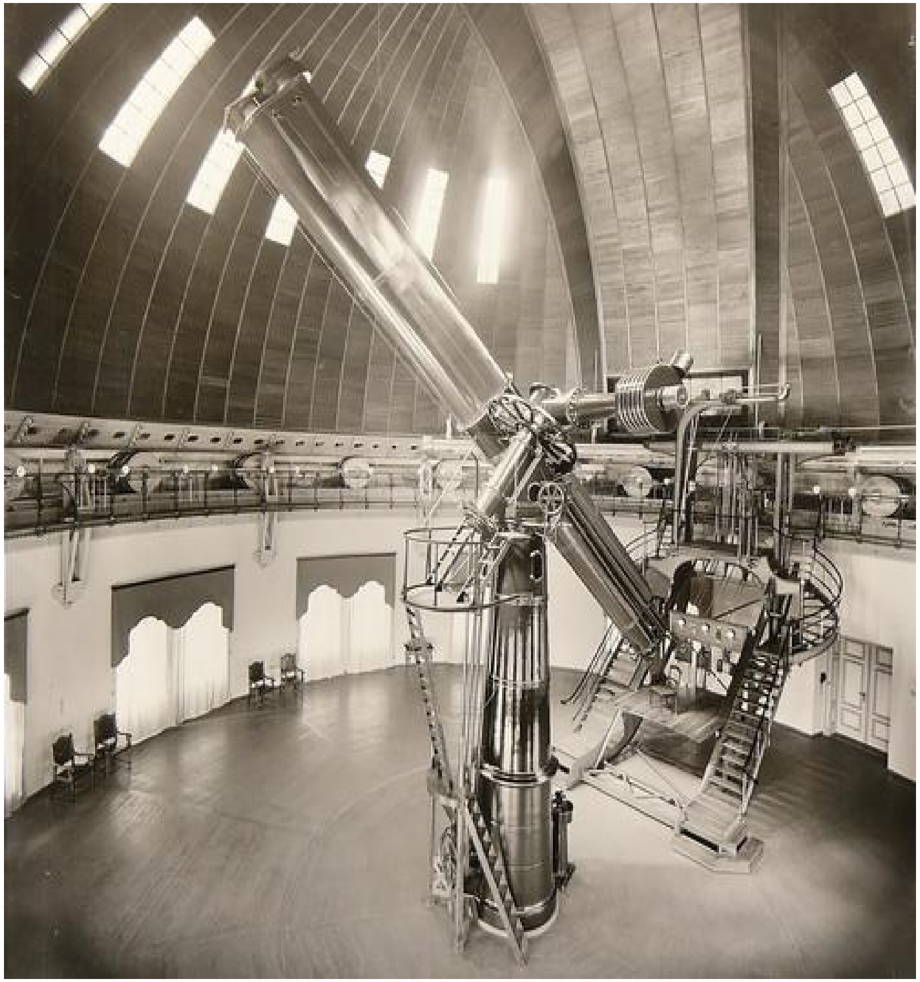
Johannes Hartmann (1865-1936)

- German astrophysicist
- Professor at University in Potsdam
- Potsdam leader in spectroscopy measurement.
- Hartmann demonstrated calcium clouds in Orion.

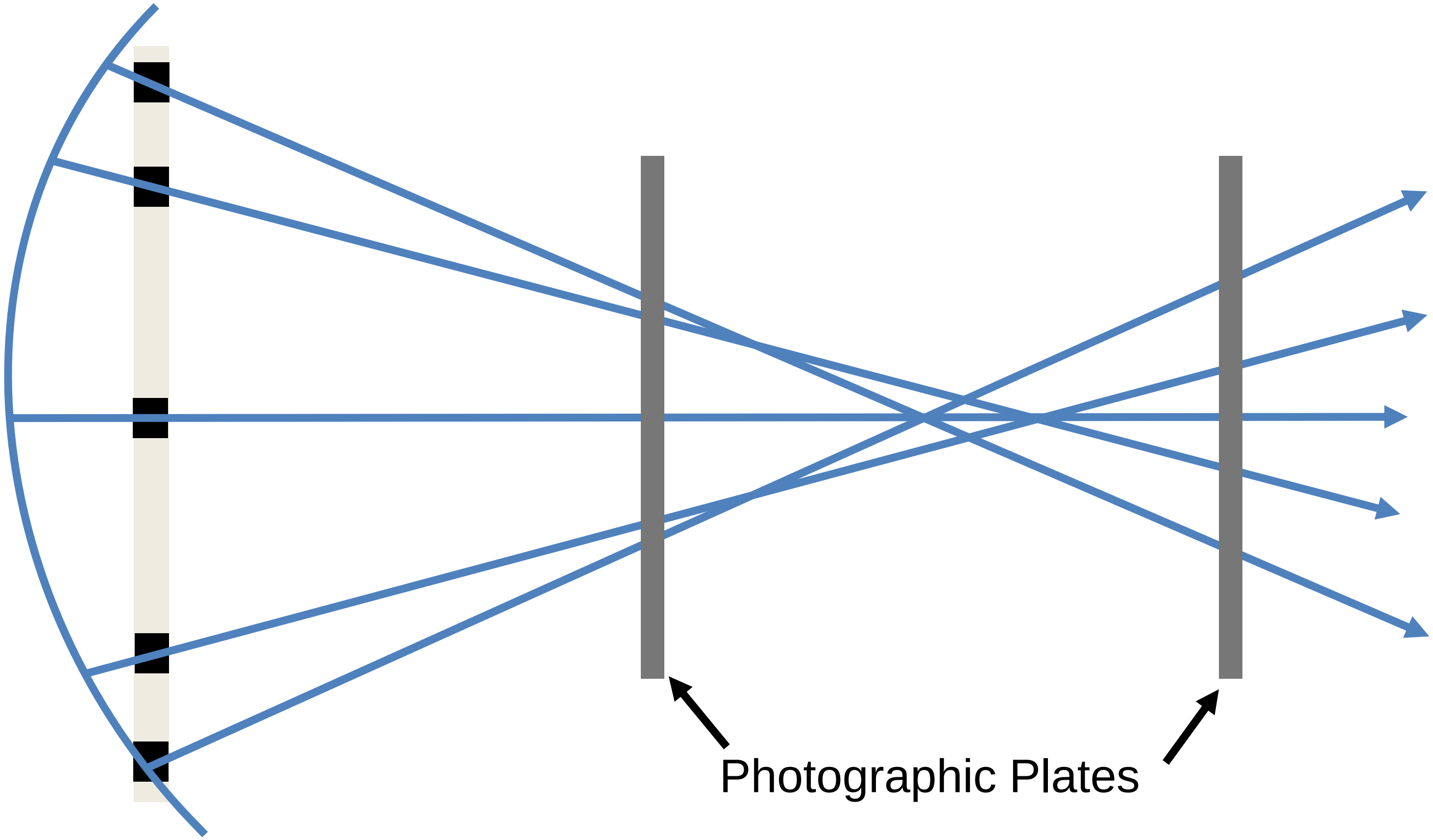


Johannes Hartmann (1865-1936)

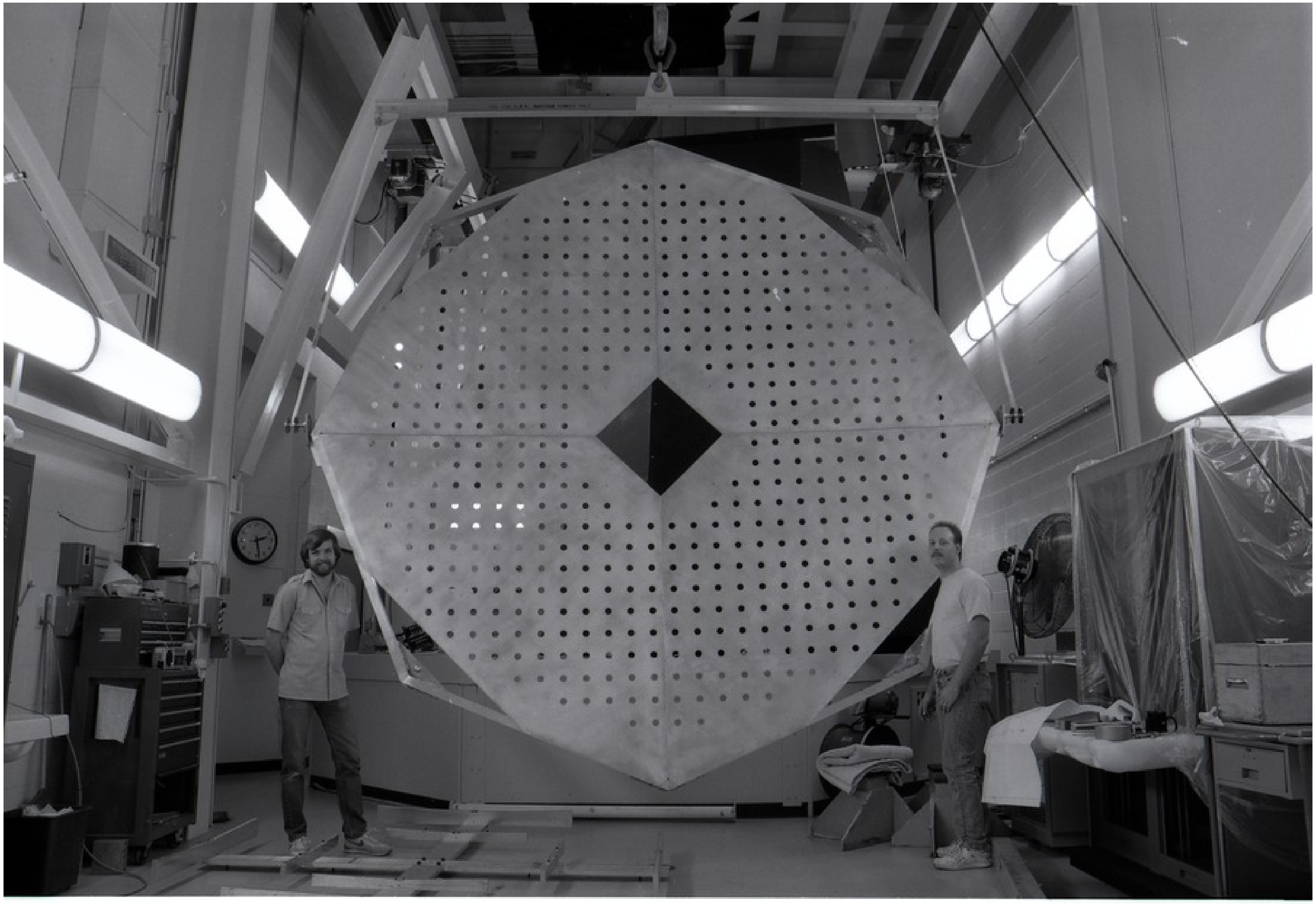
- 80 cm refracting telescope came on-line ~1902.
- Optics were poor and the telescope was unusable.
- Hartmann developed his now famous screen test to determine cause of problems.
- Primary was reworked as a result of his efforts and the telescope became usable.



Hartmann Screen Test



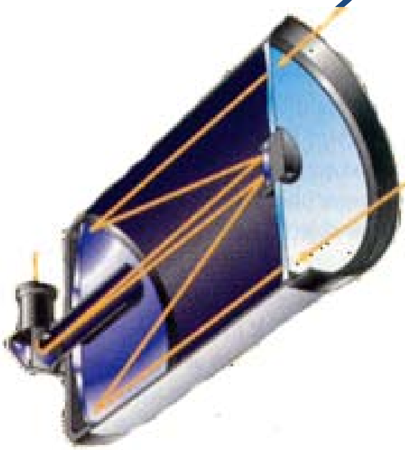
Hartmann Screen Test



www.noao.edu

Telescopes

Atmospheric Turbulence

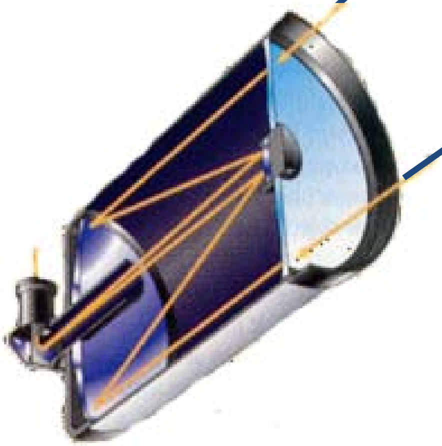


Turbulence blurs image.

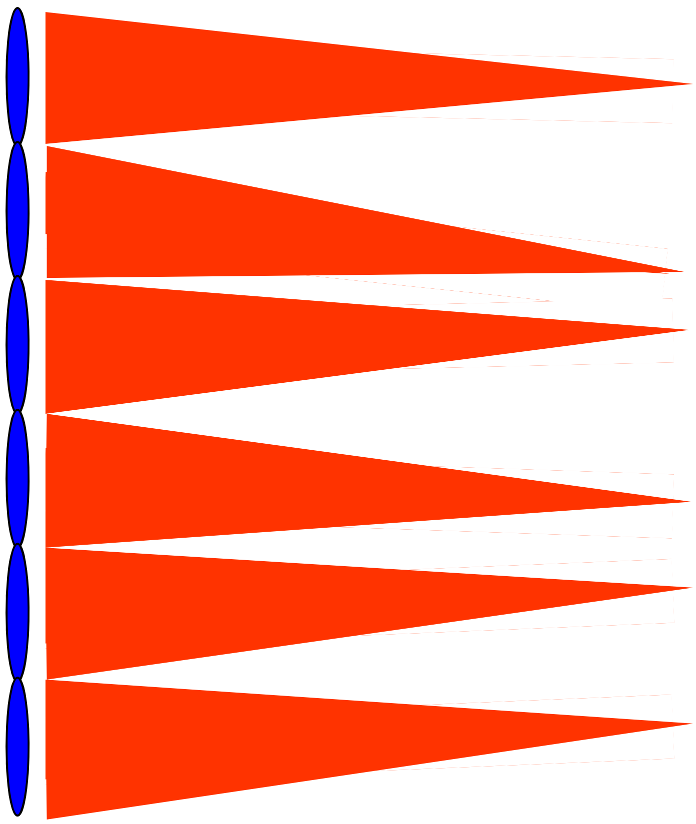
Telescopes

Wavefront Sensor
measures error due
to turbulence

Knowledge of the atmospheric
aberrations allows for the
correction of these errors.



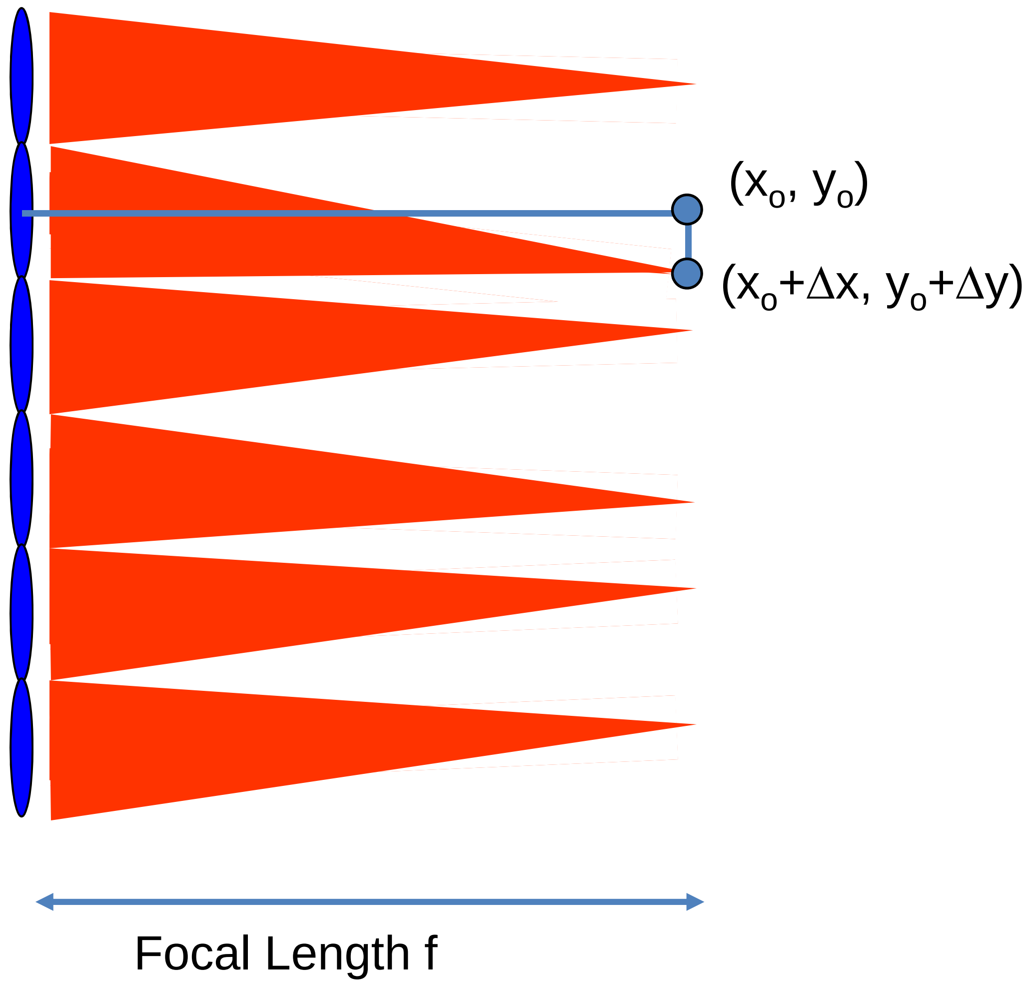
Shack's Solution



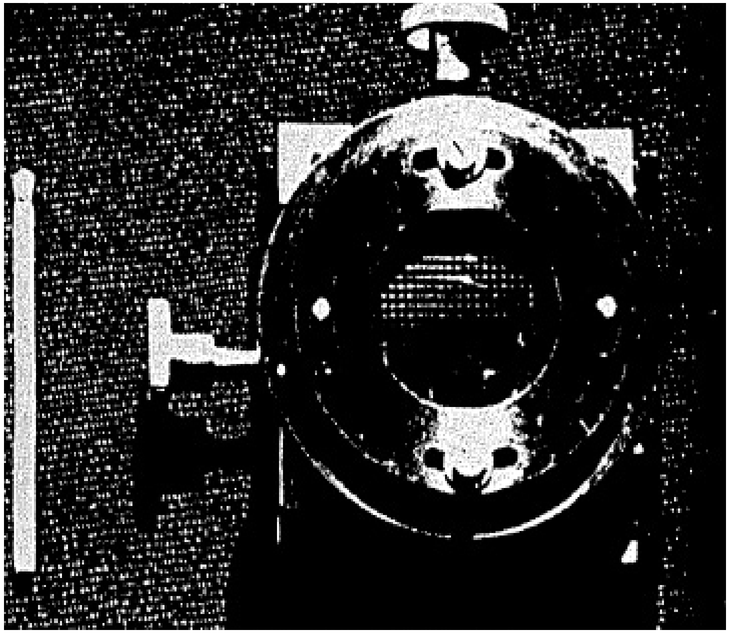
Spot Movement

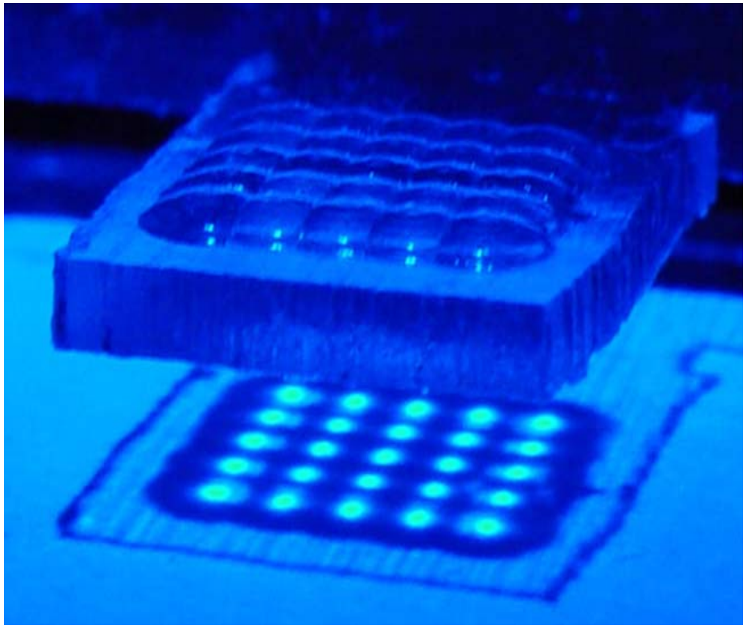
$$\Delta x = -f \frac{\partial W(x_o, y_o)}{\partial x}$$

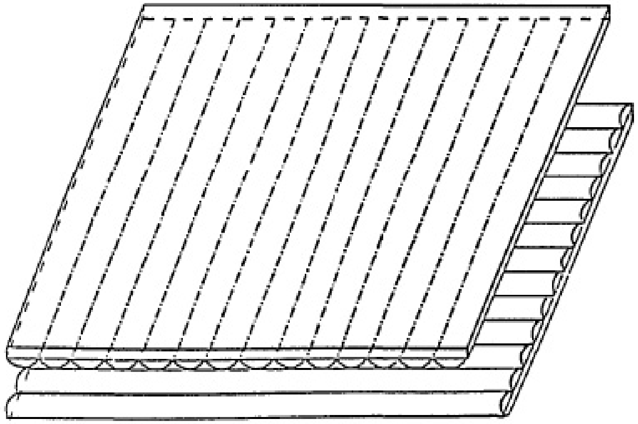
$$\Delta y = -f \frac{\partial W(x_o, y_o)}{\partial y}$$

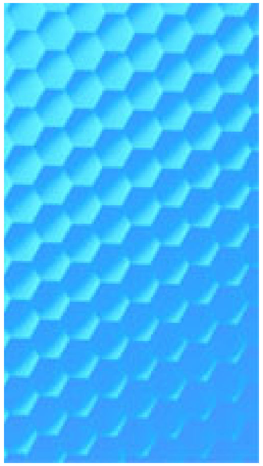


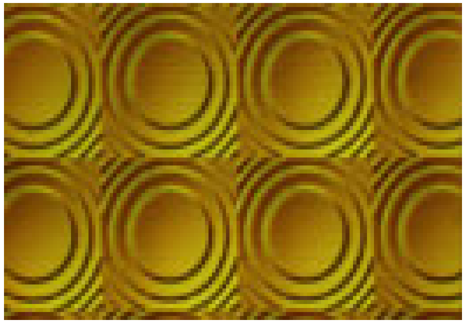
Lenslet Array





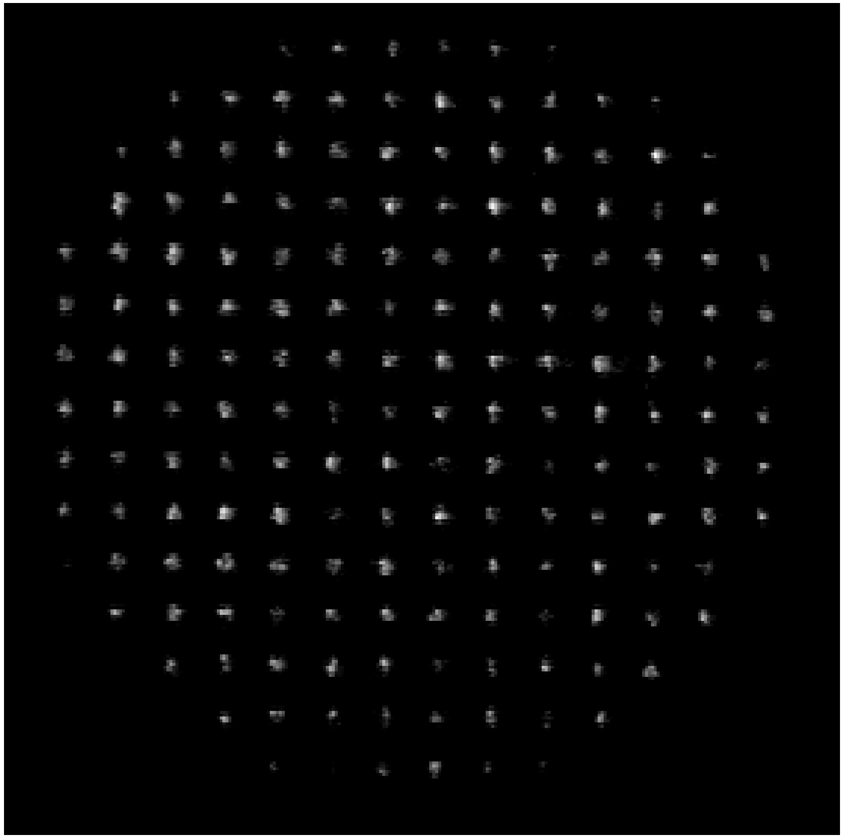






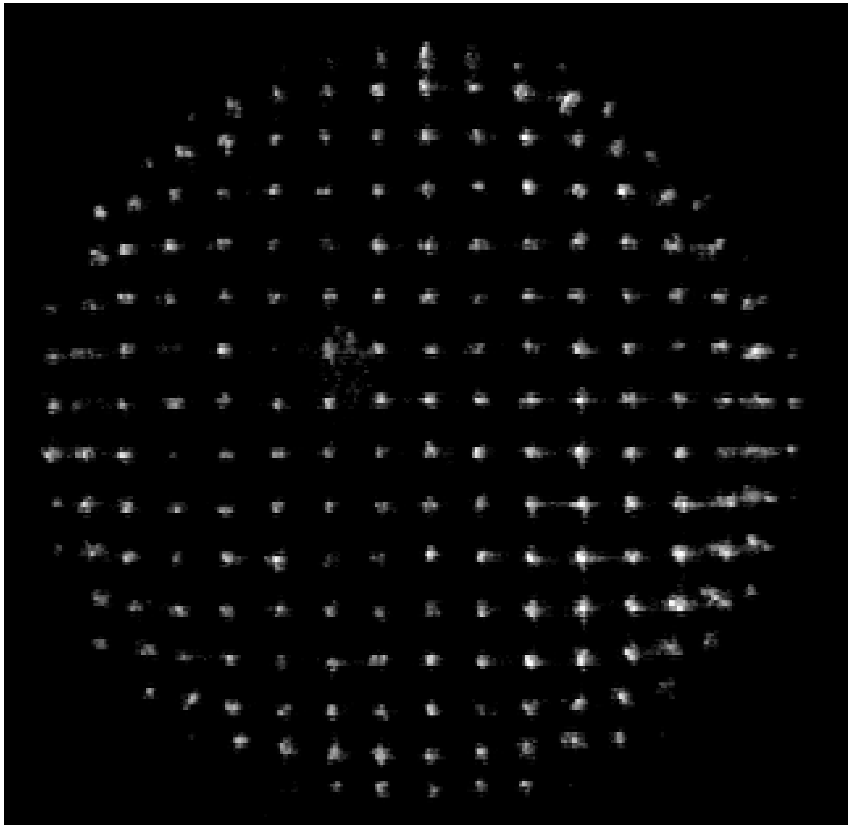
Example Images

No Refractive Surgery



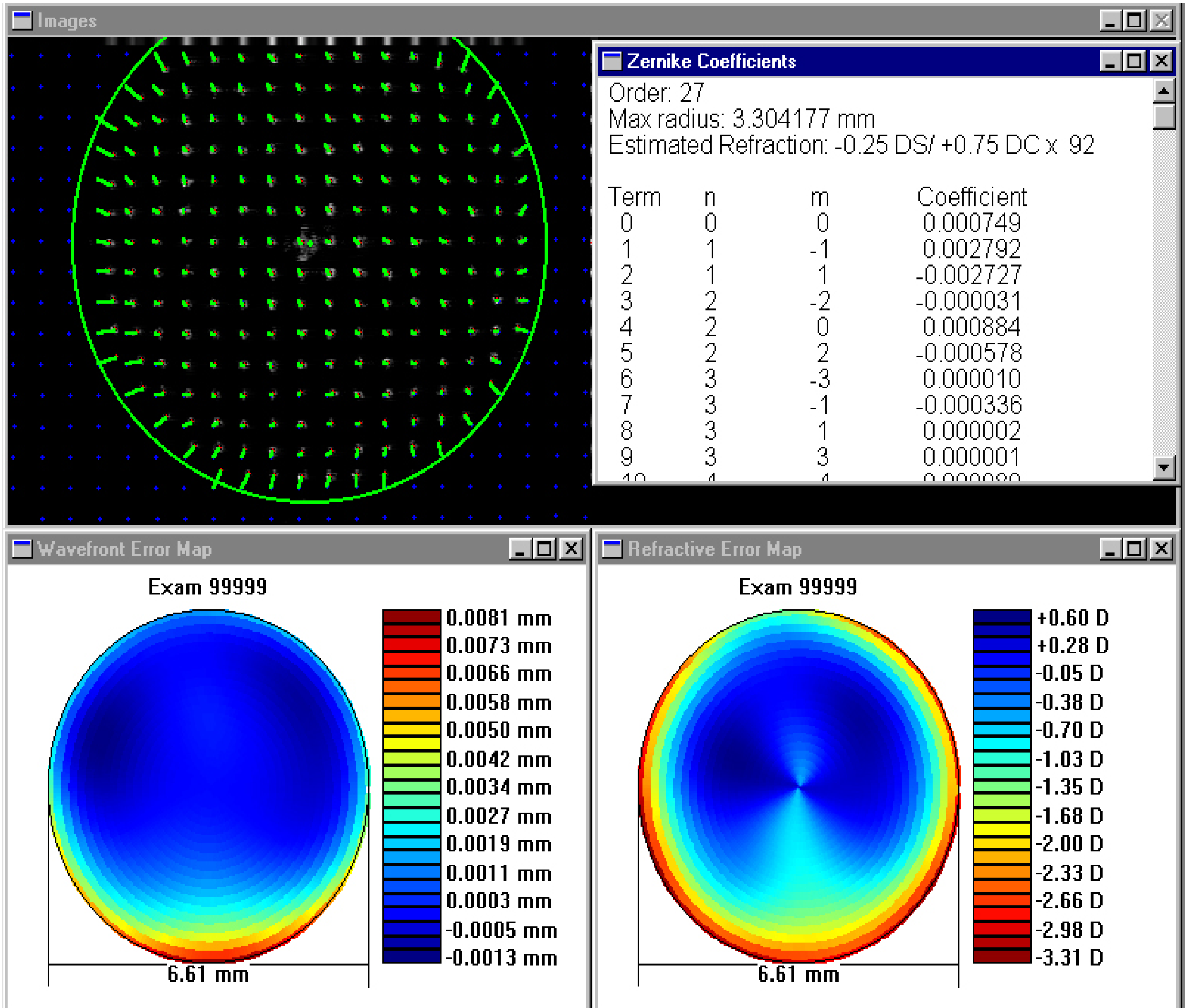
Low Aberrations

Post-LASIK with VISX Star S2

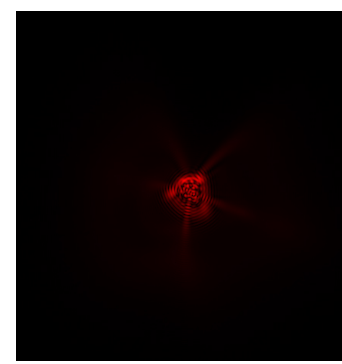


High Aberrations

Wavefront Reconstruction

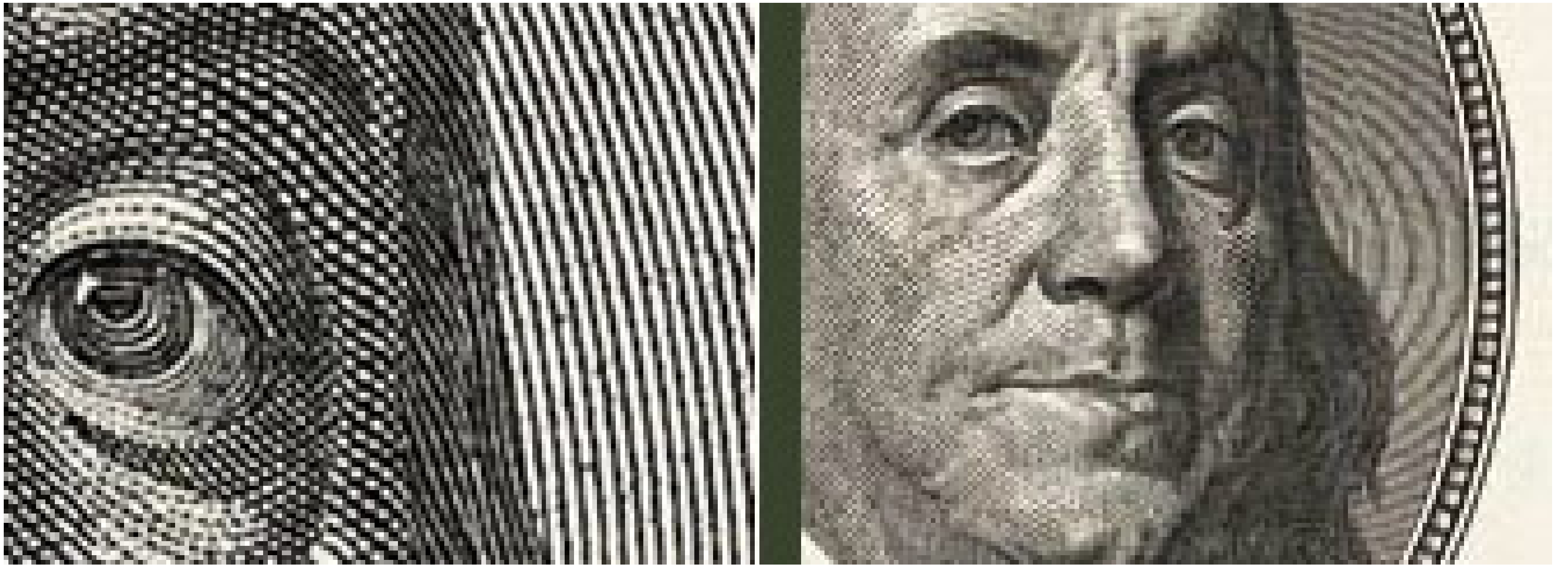


PSF



Moiré

Moiré Fringes



Moiré Deflectometry