

# Design of the MagAO-X Pyramid Wavefront Sensor

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## Summary

Adaptive optics systems correct atmospheric turbulence in real time. Most adaptive optics systems used routinely correct in the near infrared, at wavelengths greater than  $1\mu\text{m}$ . MagAO-X is a new extreme adaptive optics (ExAO) instrument that will offer corrections at visible-to-near-IR wavelengths. MagAO-X will achieve Strehl ratios greater than 70% at  $H\alpha$  when running the 2040 actuator deformable mirror at 3.6 kHz. A visible pyramid wavefront sensor (PWFS) optimized for sensing at 600-1000 nm wavelengths will provide the high-order wavefront sensing on MagAO-X. We present the optical design and an update on the alignment of the MagAO-X pyramid wavefront sensor.

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