



The RIT-Yale Tip-tilt Speckle Imager (RYTSI)

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The Purposes of RYTSI

Primary Scientific Goal

Measure binary star differential magnitudes via speckle interferometry

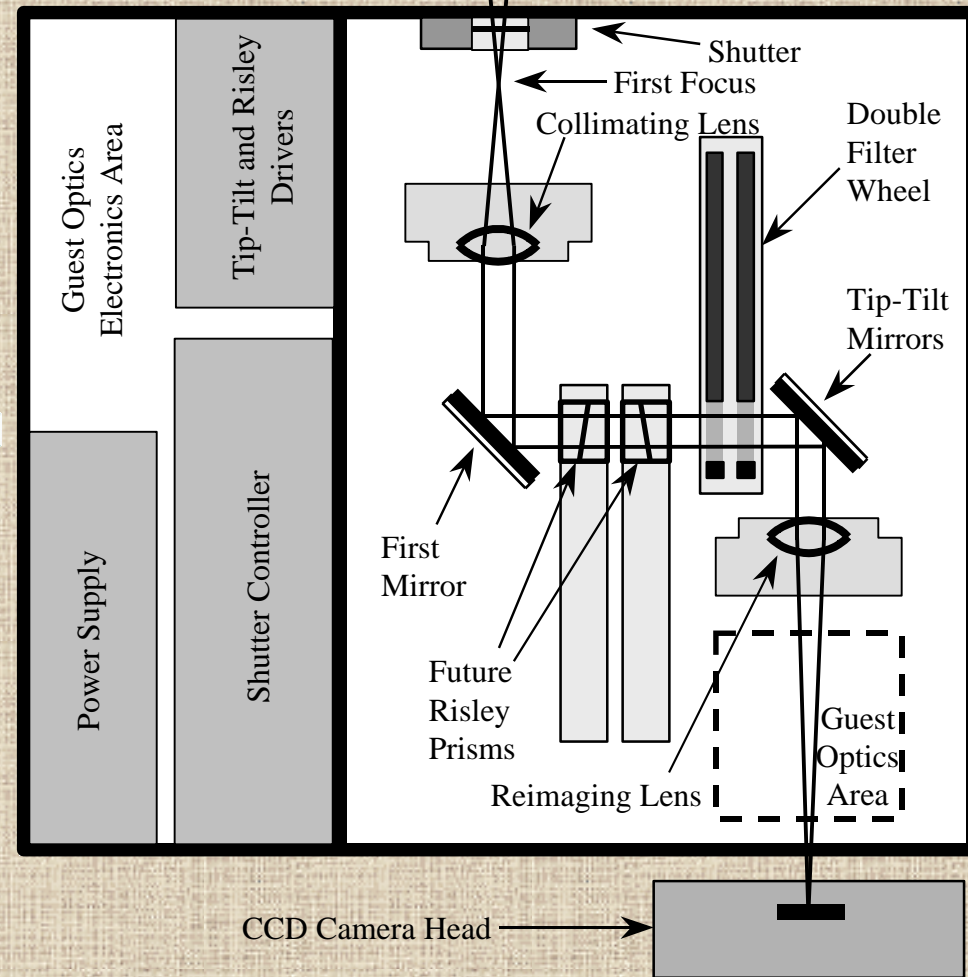
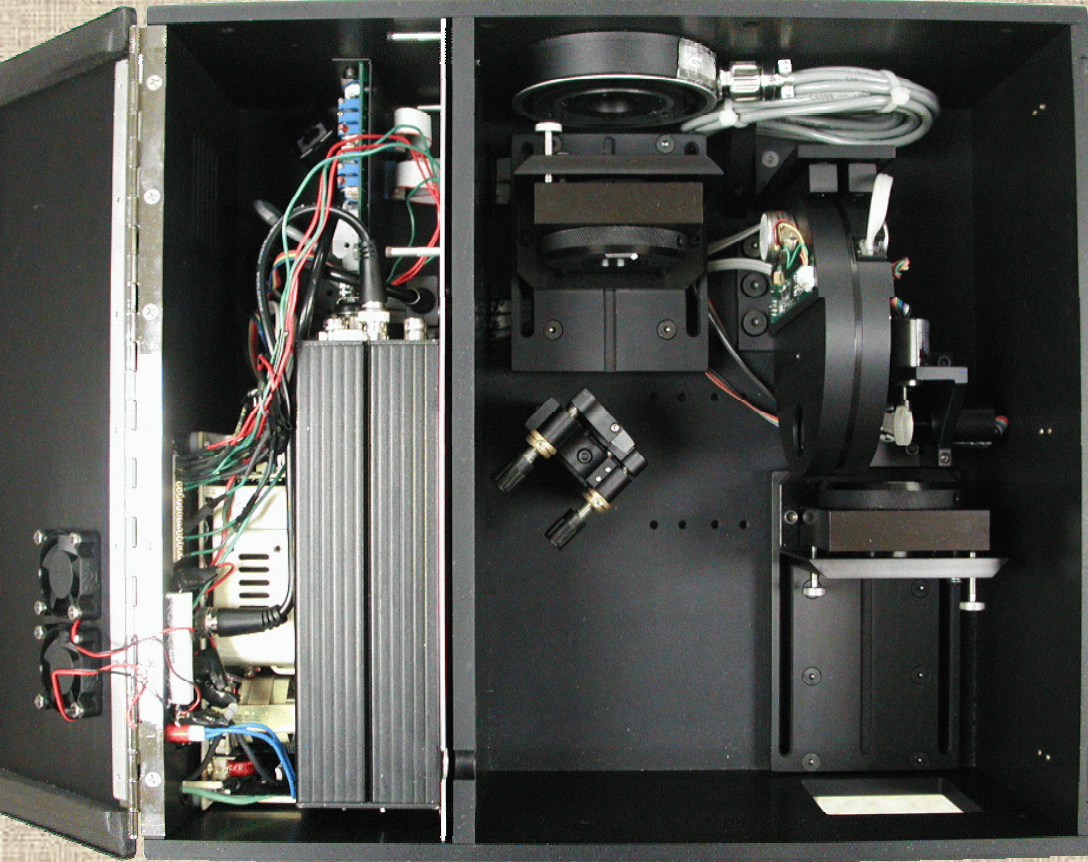
- RYTSI: first instrument designed for this purpose
- Unlike most speckle interferometry detectors, CCDs are linear

Instrumentation Goal

Turn an off-the-shelf, moderate-speed CCD into a detector suitable for stellar speckle interferometry

- Prior to RYTSI, CCDs were used, but required specialized readout methods or very fast readout speeds
- Allows focus on QE and read noise rather than speed and electronics

The Interior of RYTSI



The WIYN Observatory

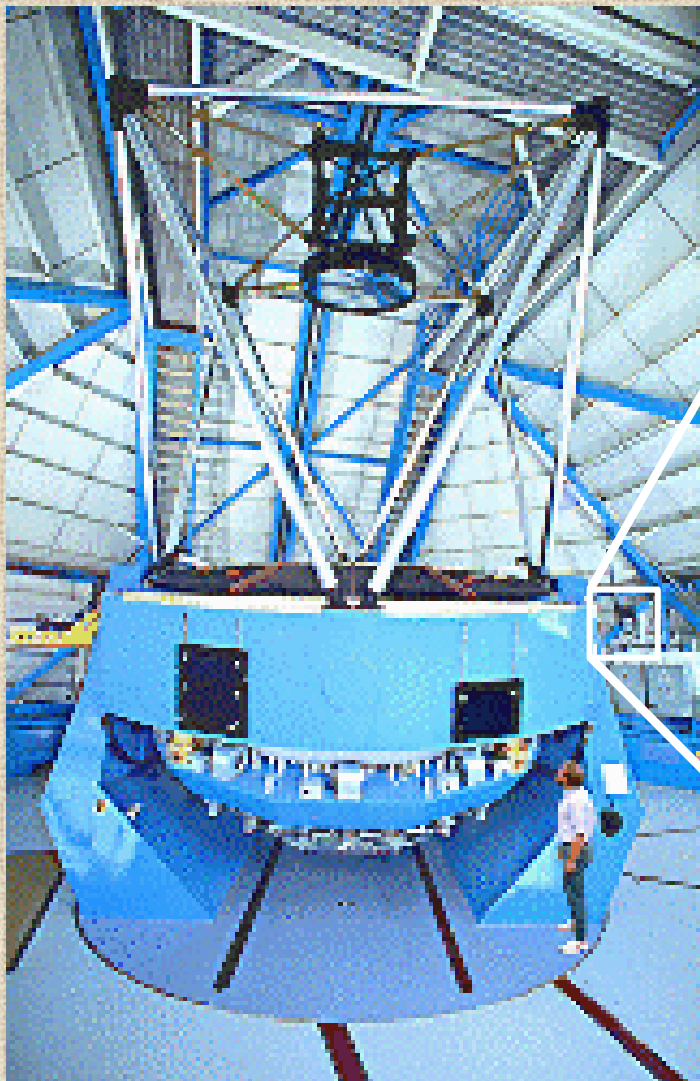


The WIYN Telescope



Kitt Peak, Arizona

RYTSI Mounted at WIYN



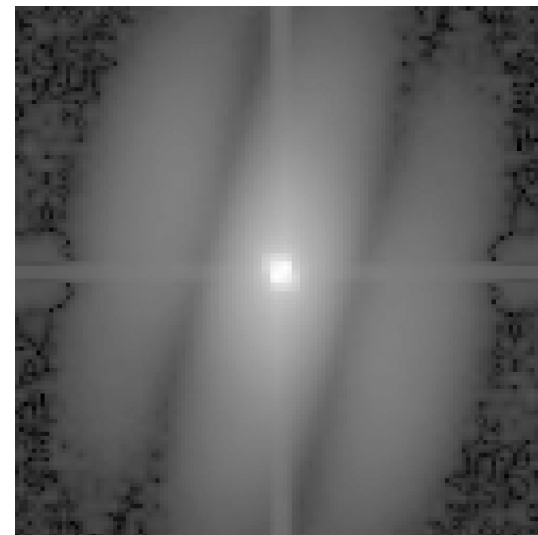
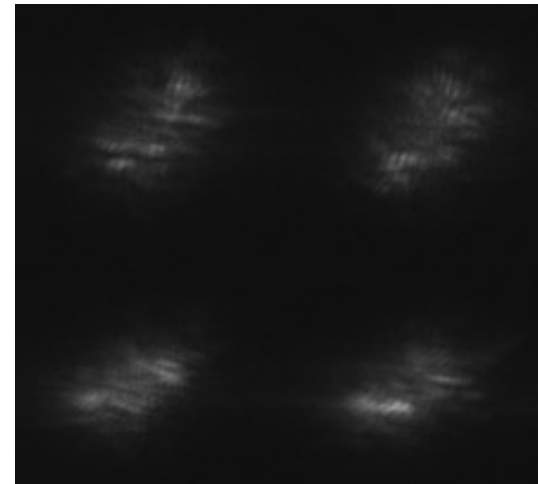
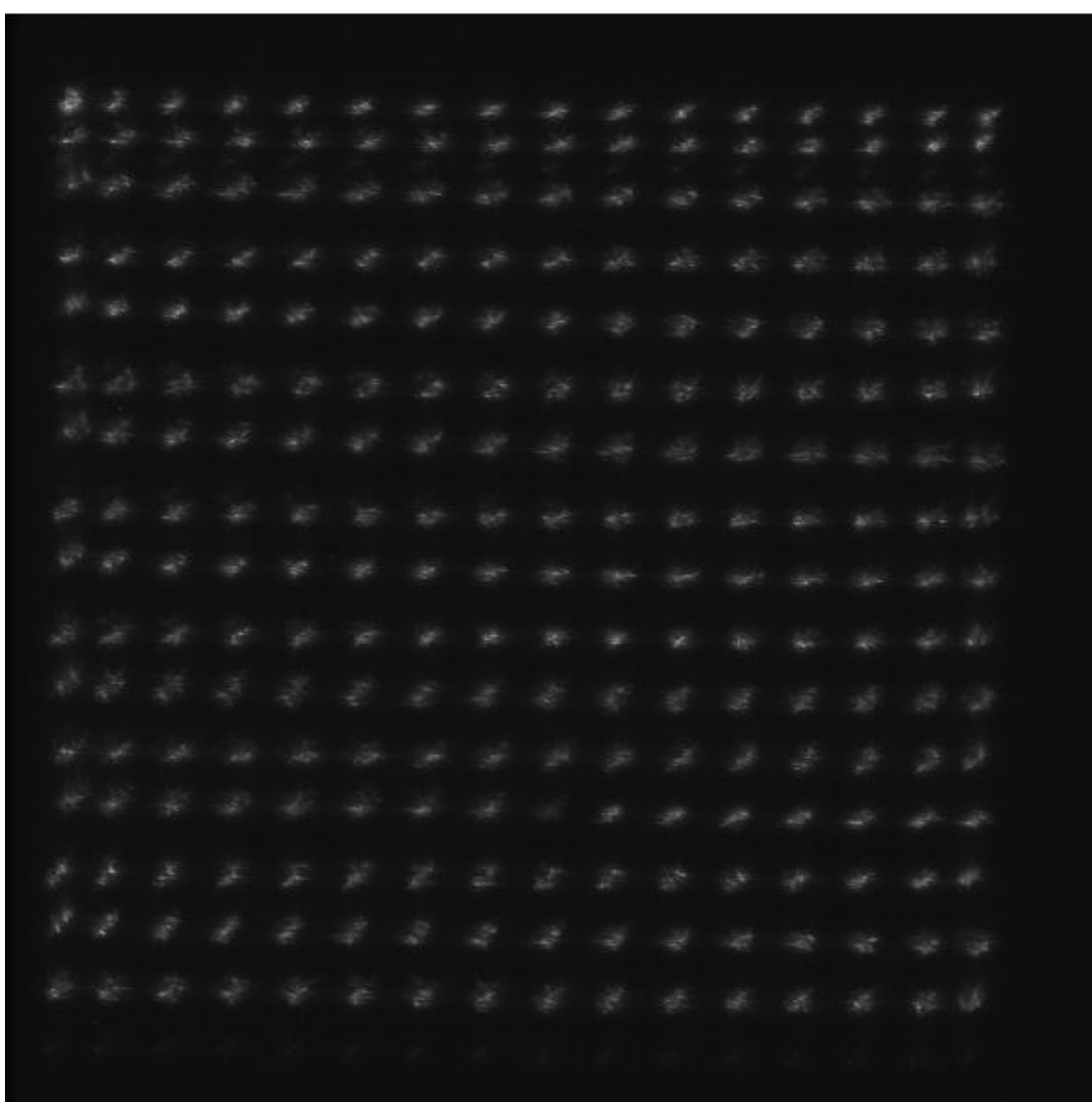
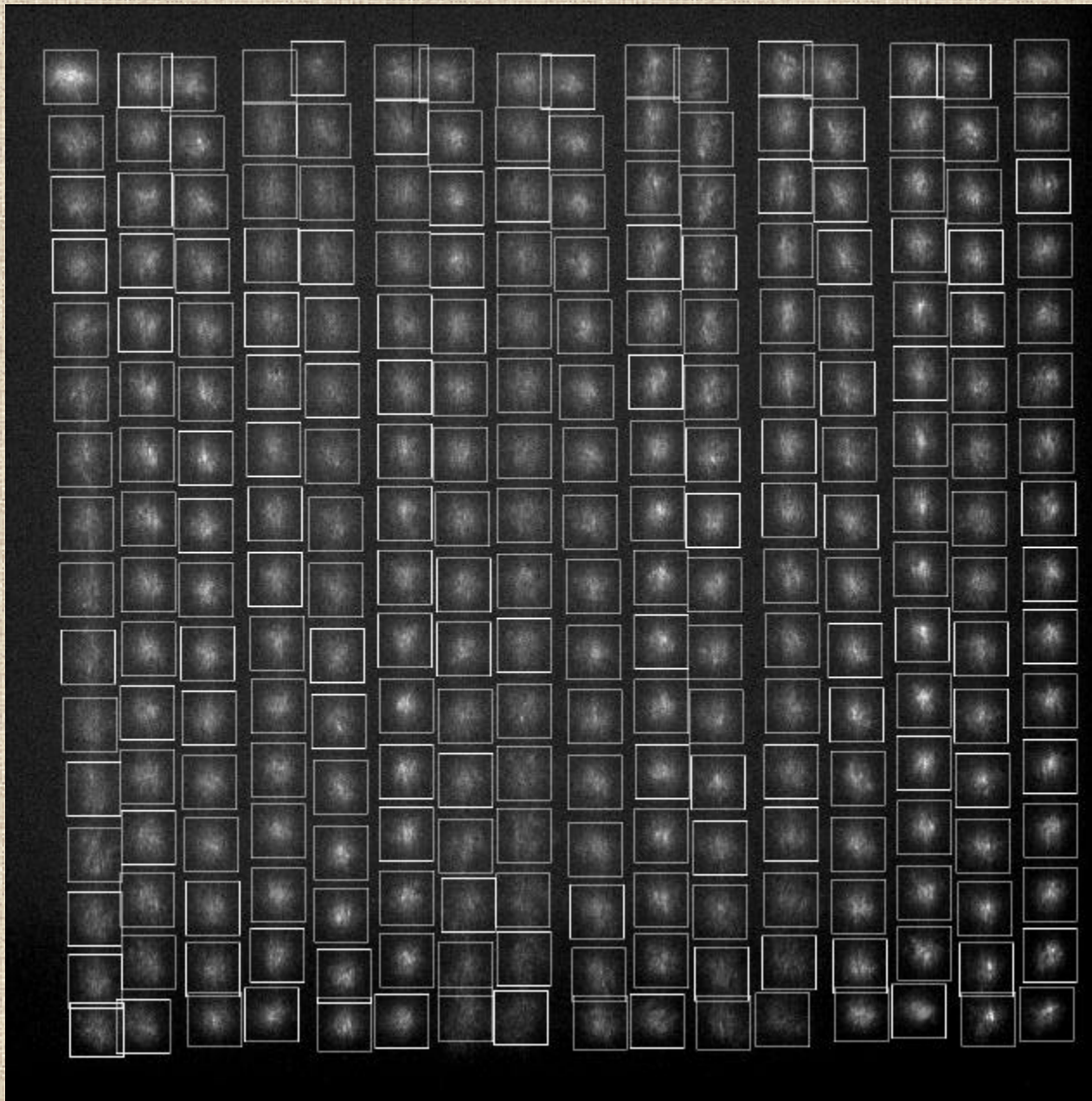


Image Position Issues



(C. Rothkopf, RIT)

Binary Star Photometry

- Important to measure stellar parameters (masses, luminosities, temperatures, etc.) *jointly*
e.g., H-R diagram (luminosity vs. temperature)
- Mass is most important stellar parameter, but can only measure masses (directly) for binary star components
- Therefore, must measure luminosities and temperatures of binary stars, to compare with masses
- Perform binary star photometry and compute luminosities and temperatures through, e.g., spectral fitting

