

## Bessel, Henderson, & Struve—28 Sept

1. You are a young astronomer in 1814. What problem do you want to study?
  - In 1814, Madison evacuated Washington, DC before the British attack.
  - Napoleonic Wars

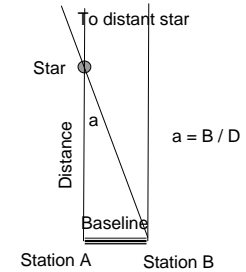


Friedrich Bessel 1784-1846  
hsg.cas.nyu.edu/images/thumbnail/19thCentury/Bessel/  
 F G Wilhelm Struve 1793-1864  
www.obs.ee/obs/pildid.html

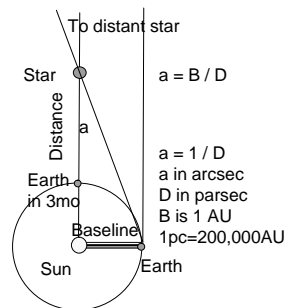
Thomas Henderson (1798-1844).

## Bessel, Henderson, & Struve Measure Distances of Nearest Stars

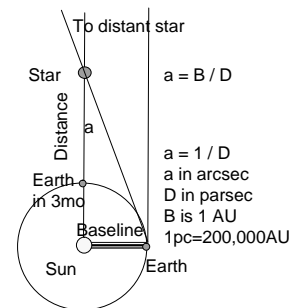
- Parallaxic angle  
 $\text{angle} = \text{baseline} / \text{distance}$
  - For the great distances of the stars, the angles are small and difficult to measure
2. You are a young astronomer in 1825. What baseline should you choose?



3. Draw the star and distant star 3 months later.



4. You are a young astronomer in 1825. Measuring the distance to one star requires years of work. What type of star should you choose to likely get a close one?



## First distances of stars 1837

- Thomas Henderson in South Africa
- Wilhelm Struve in Dorpat, now in Estonia
- Frederich Bessel in Königsberg, now in Russia

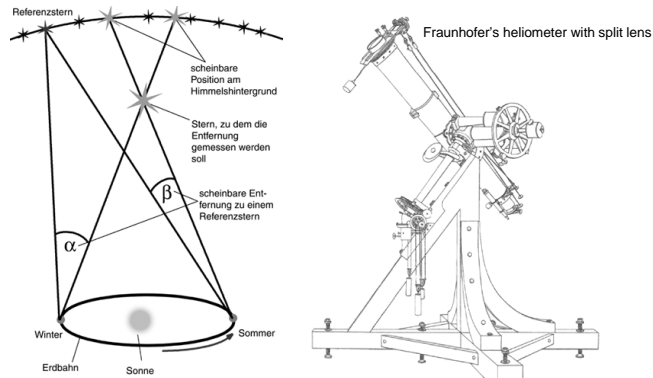
	Star	Char	Parallactic ang [arcsec]	Dist [pc]
Bessel	61 Cyg	Proper motion 5arcsec/yr	0.29	3.4
Struve	Vega	Bright	0.12	8.3
Henderson	$\alpha$ Cen	Bright	0.75	1.3

## F G Wilhelm Struve

- Petition to Prince Lieven, Chancellor of University of Dorpat: "The opportunity to acquire this instrument, the possession of which would raise our observatory to one of the first in Europe, perhaps will never return."
- The Great Refractor built by Fraunhofer arrived in 22 crates in 1824, and the city of Dorpat celebrated.
- Czar Alexander I sent diamond rings to Struve & Fraunhofer.



## Friedrich Bessel



pluslucis.univie.ac.at/ FBA/FBA99/Neho/3\_1\_1\_.htm

## Summarizing Question

- What was known about the universe in 1850 that was not known in 1814?