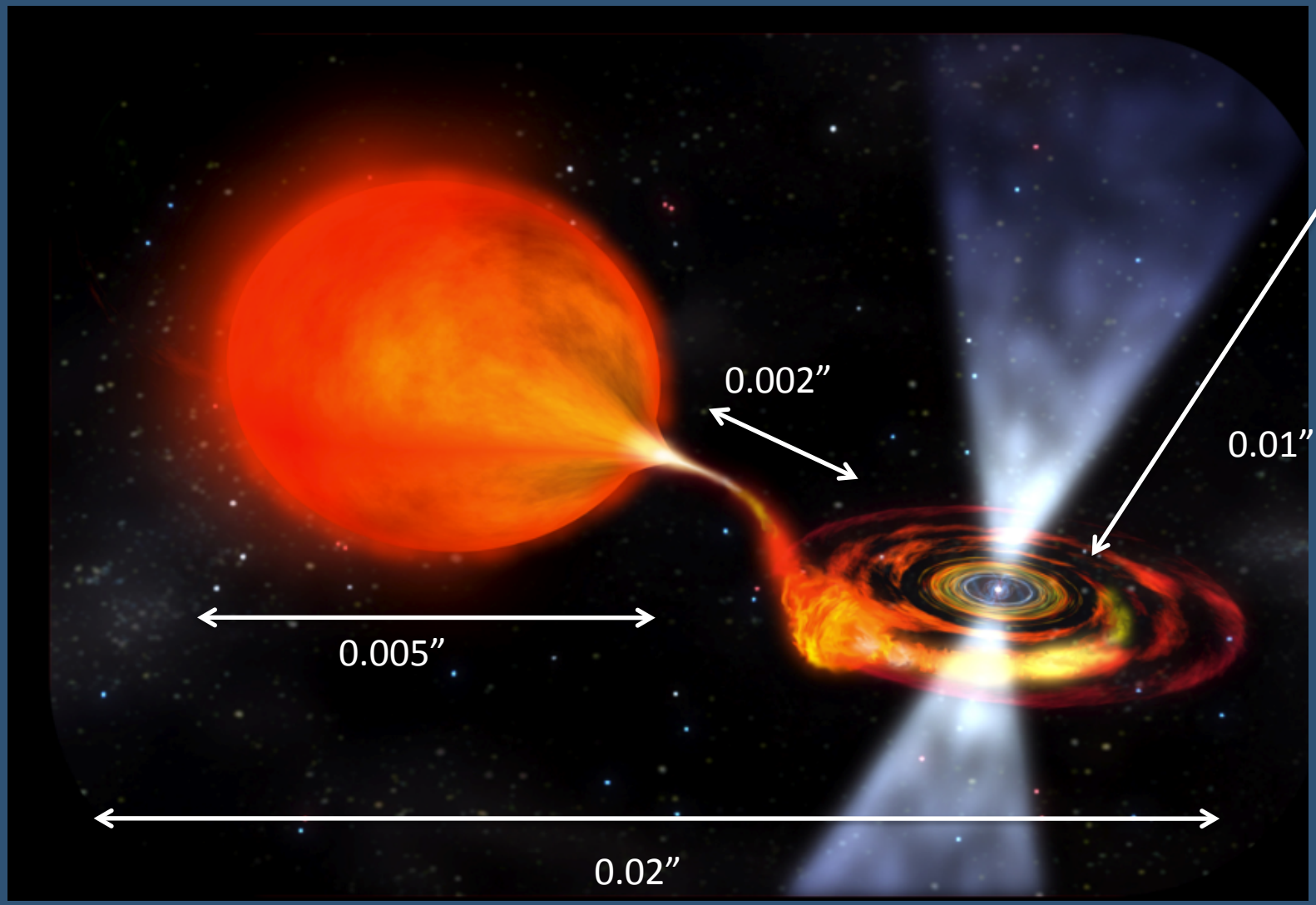
Design your own!



Design your own!

Study objects like those. You want to be sensitive to the emission from each component, be able to separate them, and know the full emission of the system.

Observing frequency: 3-4GHz (synchrotron jets)
Observing time: 8 hours per object
Sensitivity required: 22μ Jy/beam
Aperture Efficiency: 0.6, Correlator Efficiency: 0.9
Tsys: 50K

$$\delta\theta \sim \frac{\lambda}{D_{max}}$$ ← Resolution

$$\theta_{max} \sim \frac{\lambda}{D_{min}}$$ ← Largest Structure

$$\sigma_{interf} = \frac{2k_B\sqrt{T_{sys1}T_{sys2}}}{\sqrt{\eta_{ap1}\eta_{ap2}}(\text{Area})} \cdot \frac{1}{\eta_{corr}\sqrt{\tau\Delta\nu}} = \frac{2k_B\sqrt{50K*50K}}{\sqrt{0.6*0.6}(\text{Area})} \cdot \frac{1}{0.9\sqrt{\tau\Delta\nu}} = 2.5{*}10^5 \frac{1}{(\text{Area})\sqrt{\tau\Delta\nu}} \frac{Jy}{beam}$$

Questions:

1. How far should your antennas be (what resolution do you need)?
2. How many antennas do you need?
3. How big will you make each antenna?
4. Where could you put such an instrument?

Just for comparison, what size optical telescope would you need for resolution?