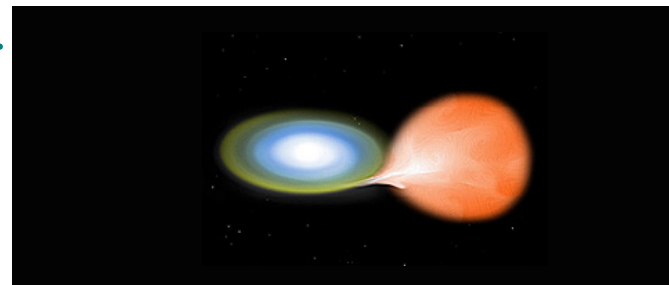
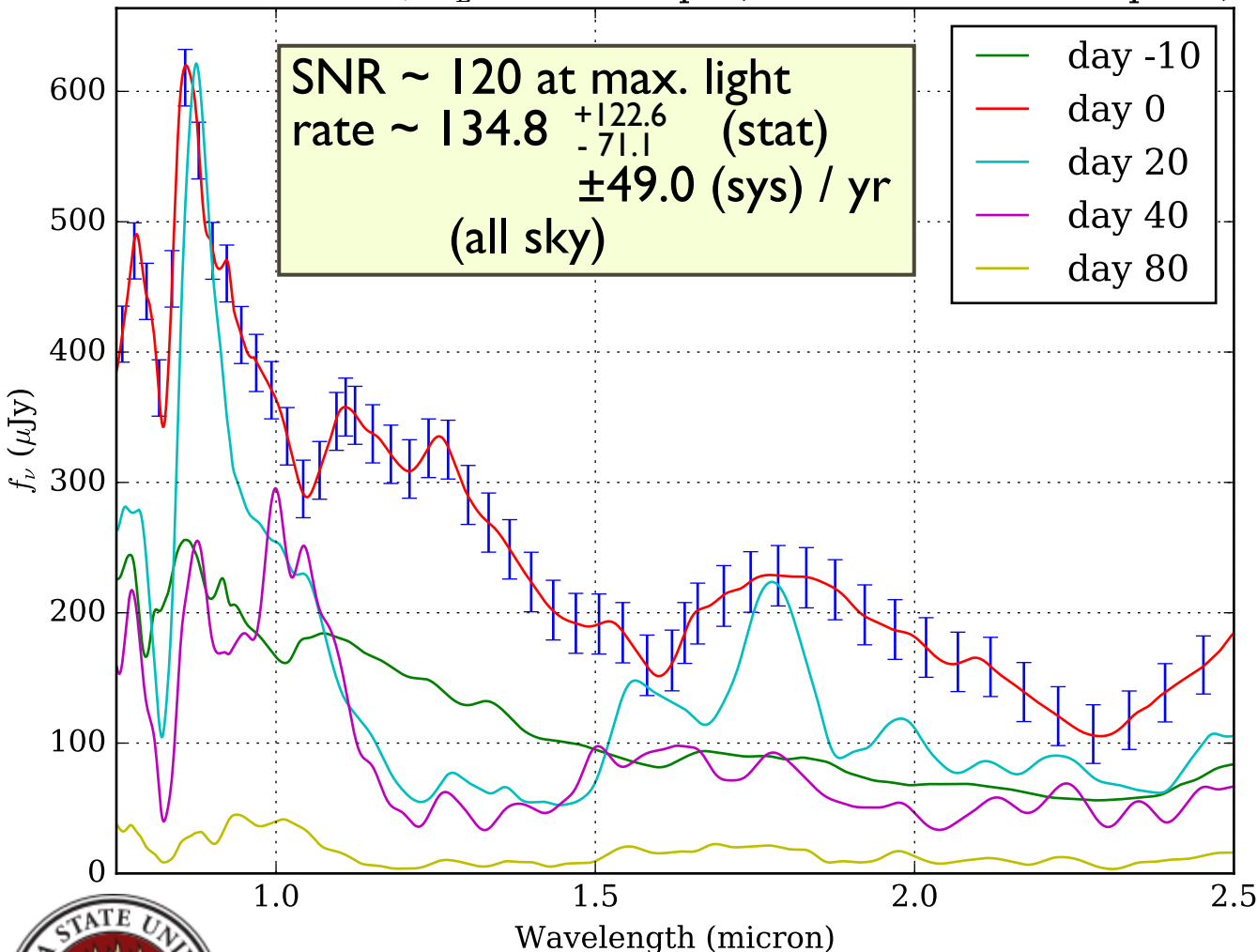


# SPHEREx and Supernovae

Studies of local Type Ia offer insight into SN physics: subtypes, explosion mechanisms, progenitors channels... *Aids precision cosmology with distant SN.*

SN Ia  $z = 0.020$ ,  $D_L = 85.32$  Mpc (Hsiao et al 2007 template)



**Unbiased rate measurements**

Type Ia max. light  
template at SNR  $\sim 5$   
out to  $z = 0.09$

11 k/yr all sky...  
 $\sim 1$  every 5 days in  
daily scan area

Core collapse SN 3-4  
times as common but  
dimmer



Kevin Huffenberger, Eric Hsiao, Peter Hoeflich, Jeremiah Murphy

# Mid-IR can reveal mechanisms

## Big questions:

Do WDs explode at the Chandrasekhar mass limit?

Is explosion by delayed-detonation or merger?

Detection / time evolution of CO bands:

- significant amounts of carbon,
- low explosion temperatures,
- sufficiently high densities,
- ionization environment in photosphere

Constrains explosion / progenitor scenarios.

**SPHEREx stands out with observations at >2.5 micron**

