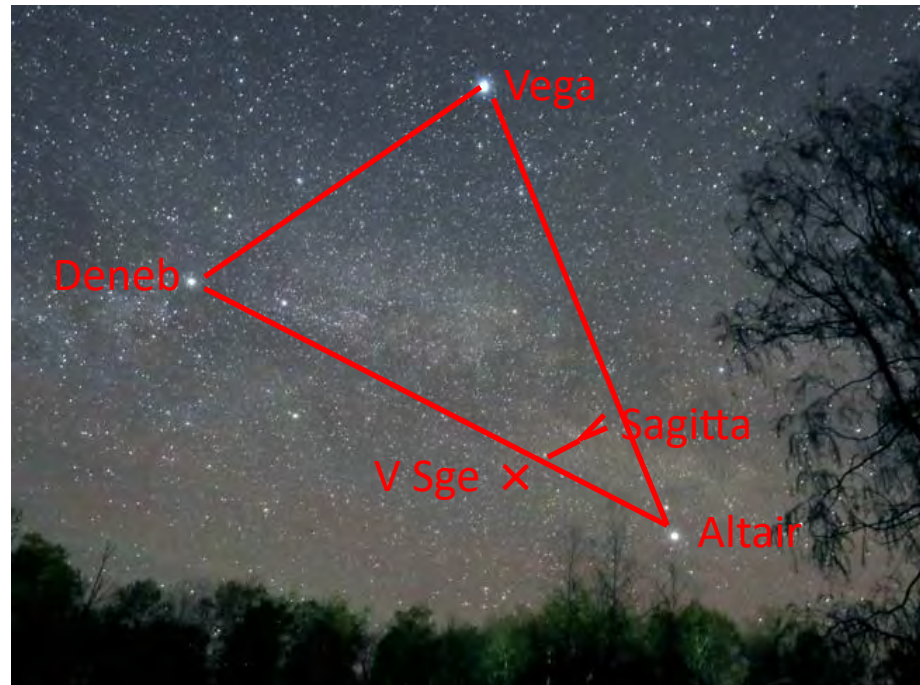


# V SAGITTAE WILL MERGE IN THE YEAR $2083 \pm 16$ , BECOMING AS BRIGHT AS SIRIUS

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V SAGITTAE (V Sge) IS CURRENTLY AN INCONSPICUOUS FAINT STAR:  
Sagitta is the “Arrow” constellation, and the Arrow points at V Sge



V SGE IS A CATAclysmic VARIABLE (CV):

Binary: White dwarf + Main sequence star, Roche lobe overflow

# V SGE IS IN-SPIRALING FAST, VERY FAST

## V SGE IS THE MOST EXTREME CV:

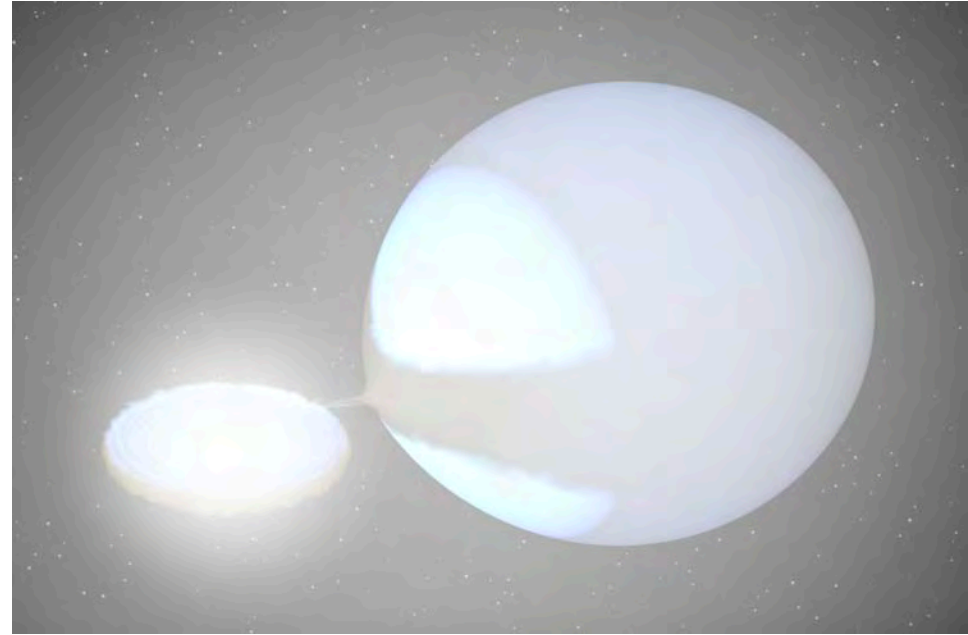
~100X brighter than all other known CVs  
Incredibly massive stellar wind

## V SGE IS UTTERLY UNIQUE

Mass ratio ( $M_{\text{comp}}/M_{\text{WD}}$ ) is 3.9  
No other CV in Local Group is known with  $>1$

## V SGE HAS A FAST SHRINKING ORBIT

- ◆ Required for mass ratio  $\gg 1$
- ◆ Orbital period since 1904 is decreasing *fast*
- ◆ Brightness and accretion rate increasing with doubling time of 89 years



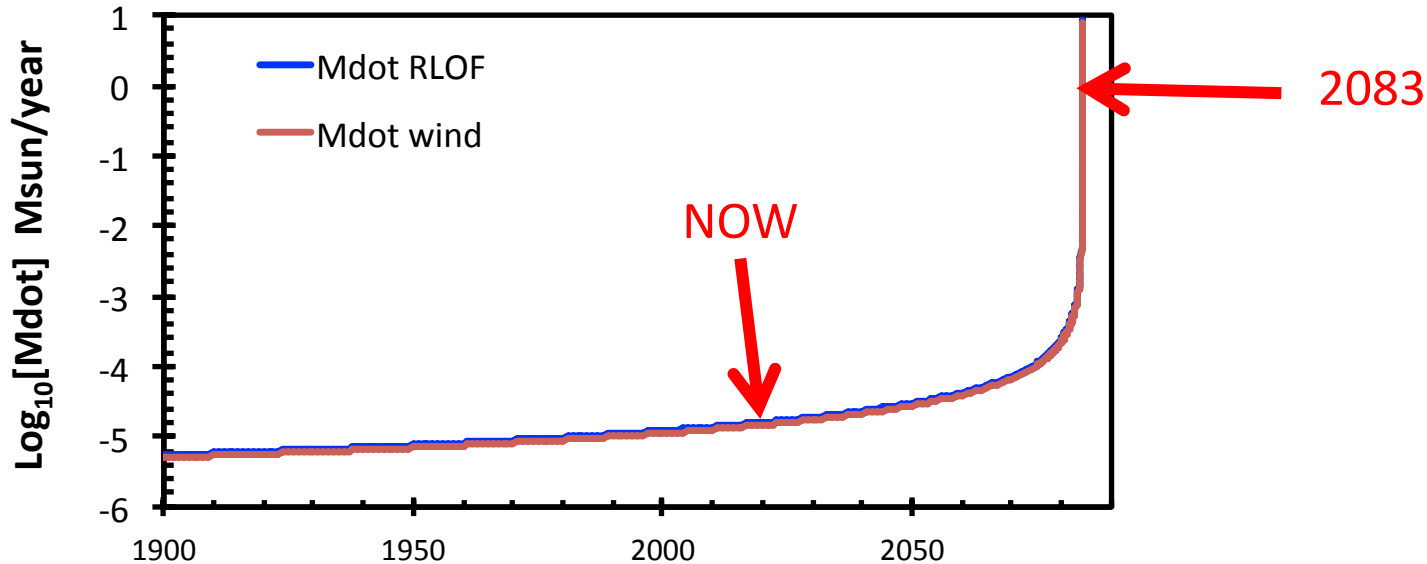
## V SGE's INEVITABLE FATE IS A MERGER

The in-spiral increases at an ever accelerating rate  
Mass will fall off the normal star, then be shot out as a fierce stellar wind  
The final death spiral will come to a cusp, with  $\sim 2$  solar-masses falling in the last week or so.  
The 'explosion' will be somewhere between a nova and a supernova  
V Sge will appear as a sudden 'guest star', lasting roughly a month near peak brightness

## V SGE WILL APPEAR AS BRIGHT AS SIRIUS IN THE SKY

Hard to get accurate estimates  
Best estimates give peak brightness in range from around Sirius to around Venus

# WHEN IS THE MERGER OF V SGE?



- ★ Merger in the year  $2083 \pm 16$
- ★ This in-spiral year is robust on variations of all inputs and observed target measures
- ★ The  $\pm 16$  year error bar is almost entirely from measurement uncertainties in the doubling time scale.

# CONCLUSIONS:

- ★ V Sge is in-spiraling very fast, now brightening at an accelerating rate
- ★ Merger in the year  $2083 \pm 16$
- ★ We will see a ‘new star’ appearing in Sagitta (the Arrow)
- ★ The ‘new star’ will be roughly as bright as Sirius or Venus

