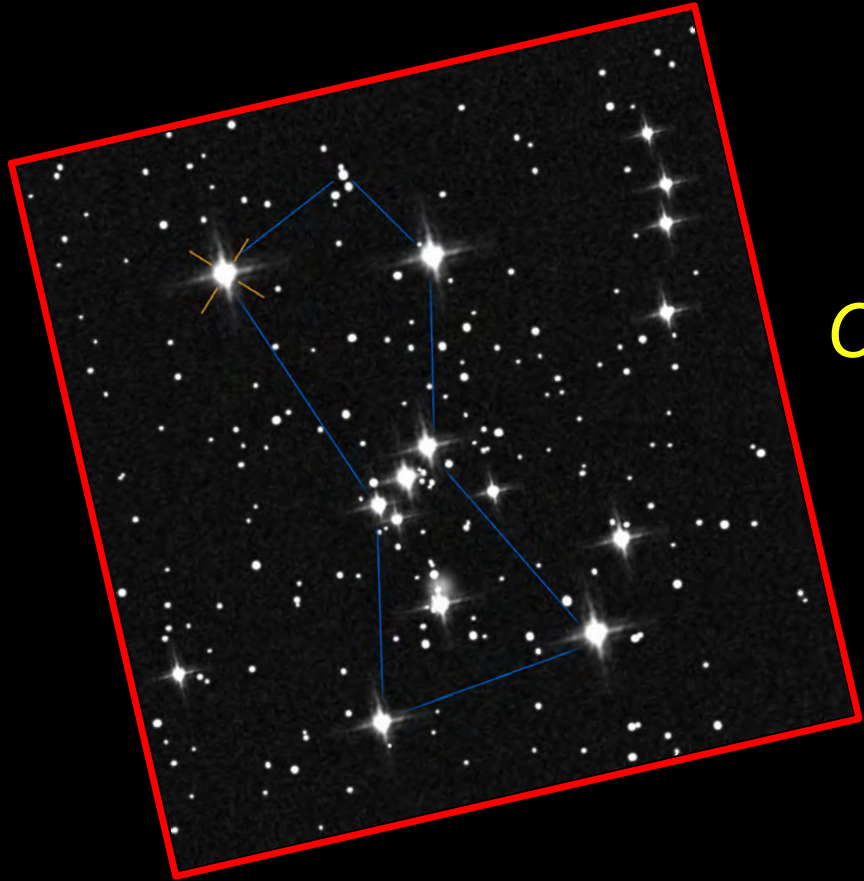


Betelgeuse, the Great Dimming: Before and After



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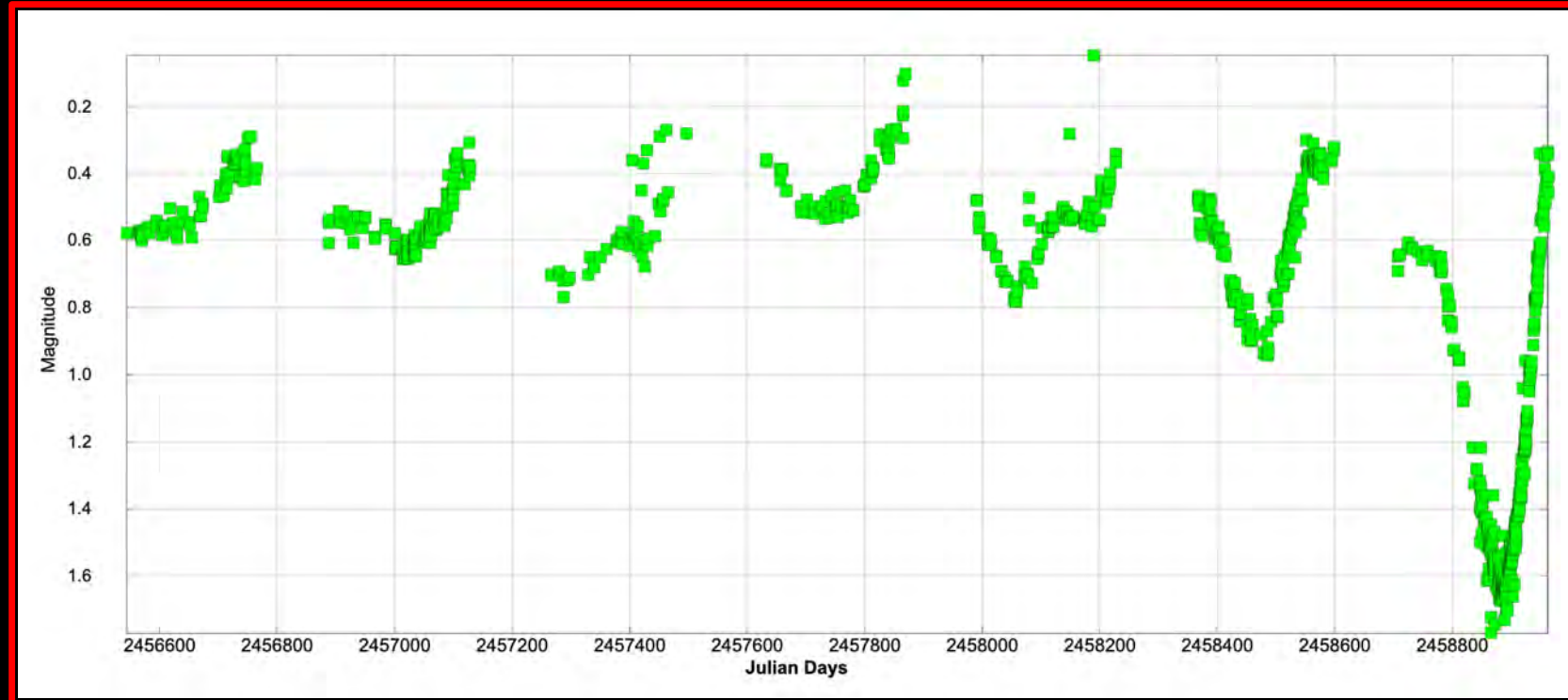
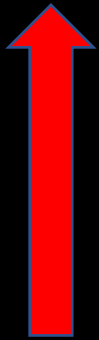
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Why is Betelgeuse important to Astronomy?

- Large, bright star... Unique: can resolve the surface
- We can learn how stars lose mass... directly
- Mass loss affects evolution, collapse, SN light curve and ultimate stellar fate
- Behavior before supernova explosion!

An Historic Dimming – February 2020

Bright

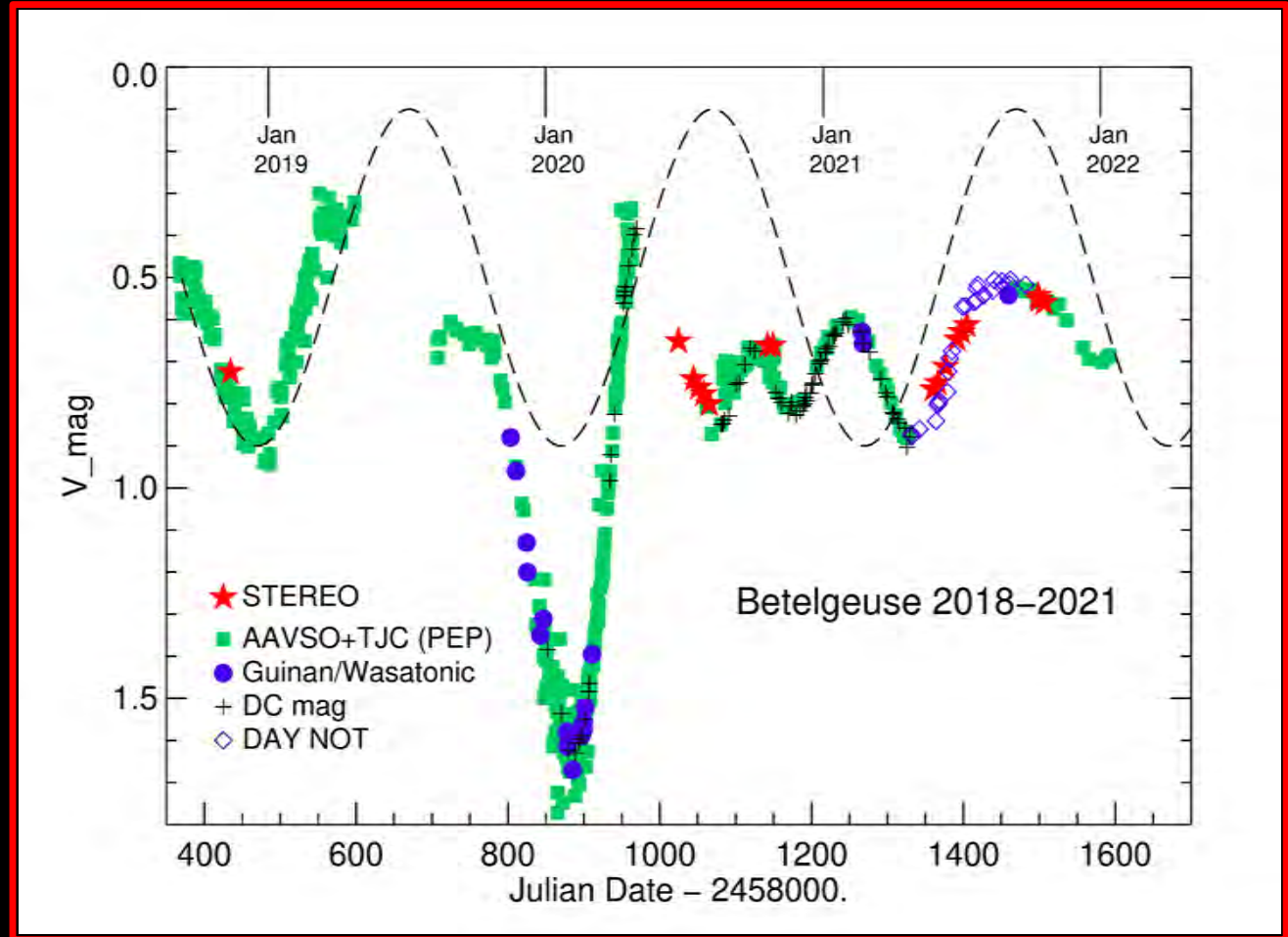


Days



What Now ?

Bright



Days



What happened?

Jan-Mar 2019



Surface outflow
Optical spectra

Sept-Nov 2019



Chromosphere outflow
Ultraviolet spectra

Jan-Feb 2020

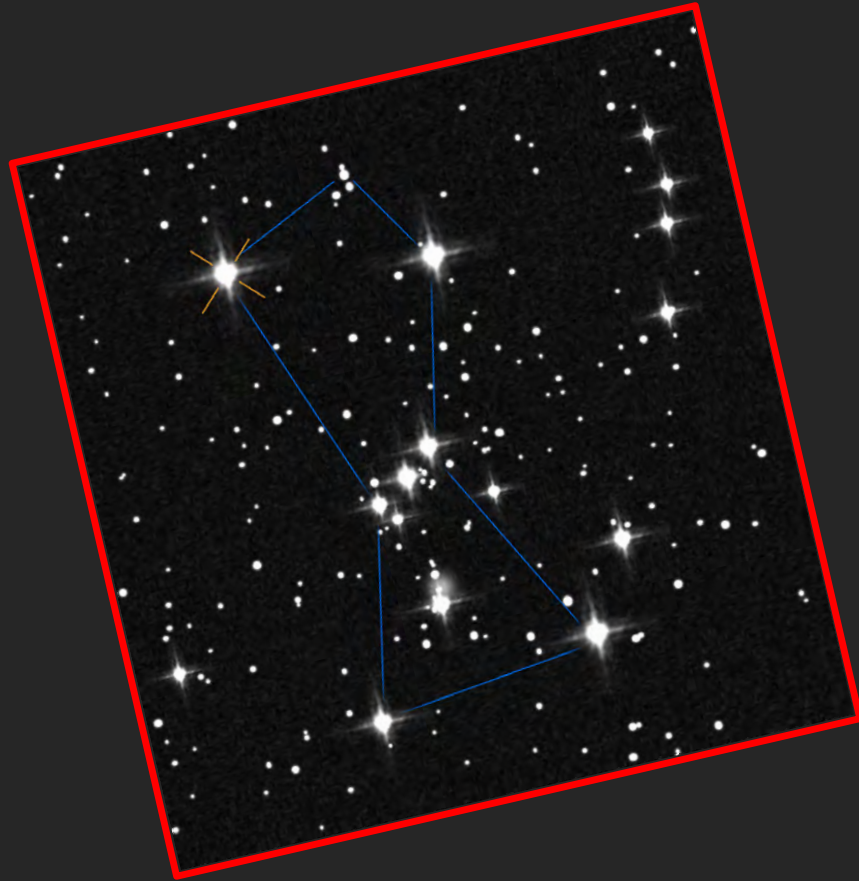


Surface: low density/
cool; Dust forms
Near-IR spectra
Optical image

Surface Mass Ejection ! (SME)

- First time observed directly!
- Propelled by shock, pulsations, magnetic fields
- Creates a cooler stellar surface
- Episodic mass loss adds to “normal” mass loss

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