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Stellar Pyrotechnics on Display in Super Star Cluster

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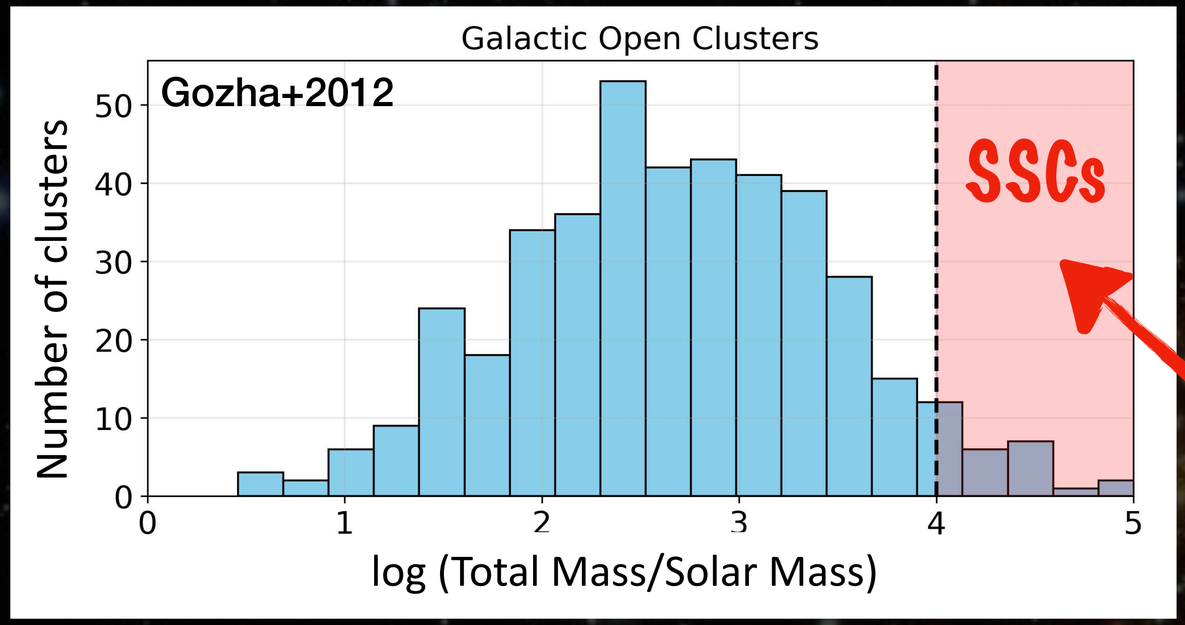
Super Star Clusters (SSCs)



- $M > 10^4\ M_\odot$
- Tens of thousands of members
- **Hundreds of massive stars**

SSCs are very rare!

Main questions:

1. How do massive stars lose mass throughout their evolution?
2. How do massive stars shape their surroundings?
3. What can super star clusters teach us about star and planet formation in extreme environments?

Westerlund 1 (Wd1)

Andersen+2017

relatively nearby

(*d* = 4.2 kpc, *Negueruela et al. 2022)*

diverse population of massive stars across many evolutionary phases

(Red supergiants, Blue & Yellow Hypergiants, Wolf-Rayet Stars, OB supergiants, Luminous Blue Variables)

young enough to potentially host protoplanetary disks

(5 – 10 Myr, *Kudryavtseva et al. 2012, Beasor et al. 2021, Navarete et al. 2022)*

Wd1 is one of the best targets to study the formation of stars and planets in a starburst environment!


Image Credit: ESO/VPHAS+ Survey/N. Wright
VST
G+R,Hα+I


Image Credit: ESO/VPHAS+ Survey/N. Wright
VST
G+R,Hα+I
JWST (NIRCam)
F150W+F277W+F444W
Image Credit. JWST NIRCam: ESA/Webb, NASA & CSA, M. Zamani (ESA/Webb), M. G. Guarcello (INAF-OAPA) and the EWOCS team

Image Credit: ESO/VPHAS+ Survey/N. Wright

VST

G+R,Hα+I

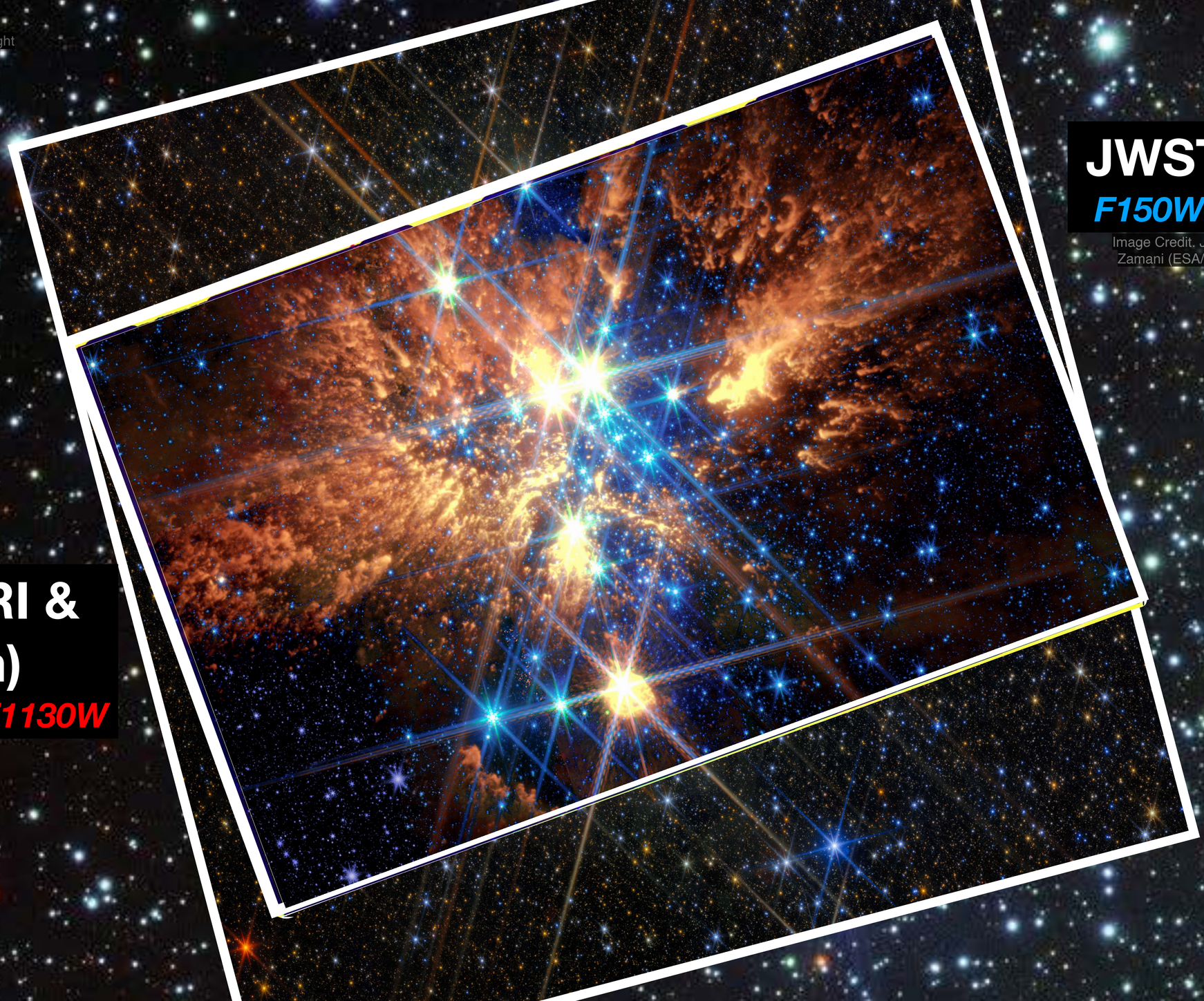
JWST (NIRCam)

F150W+F277W+F444W

Image Credit. JWST NIRCam: ESA/Webb, NASA & CSA, M. Zamani (ESA/Webb), M. G. Guarcello (INAF-OAPA) and the EWOCS team

JWST (MIRI & NIRCam)

F444W+F770W+F1130W



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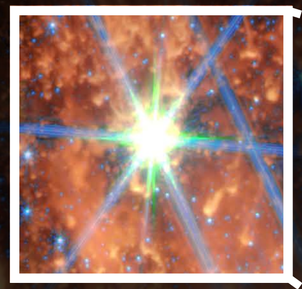
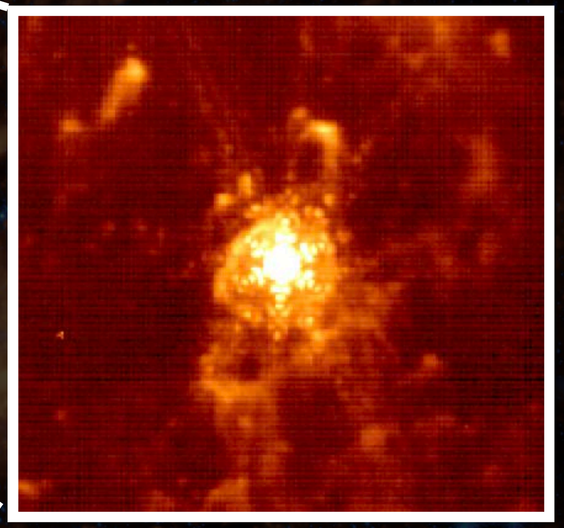
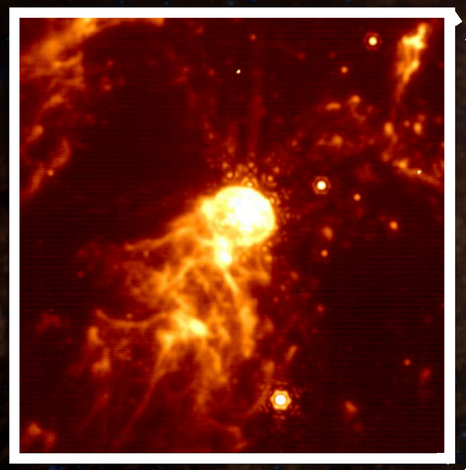
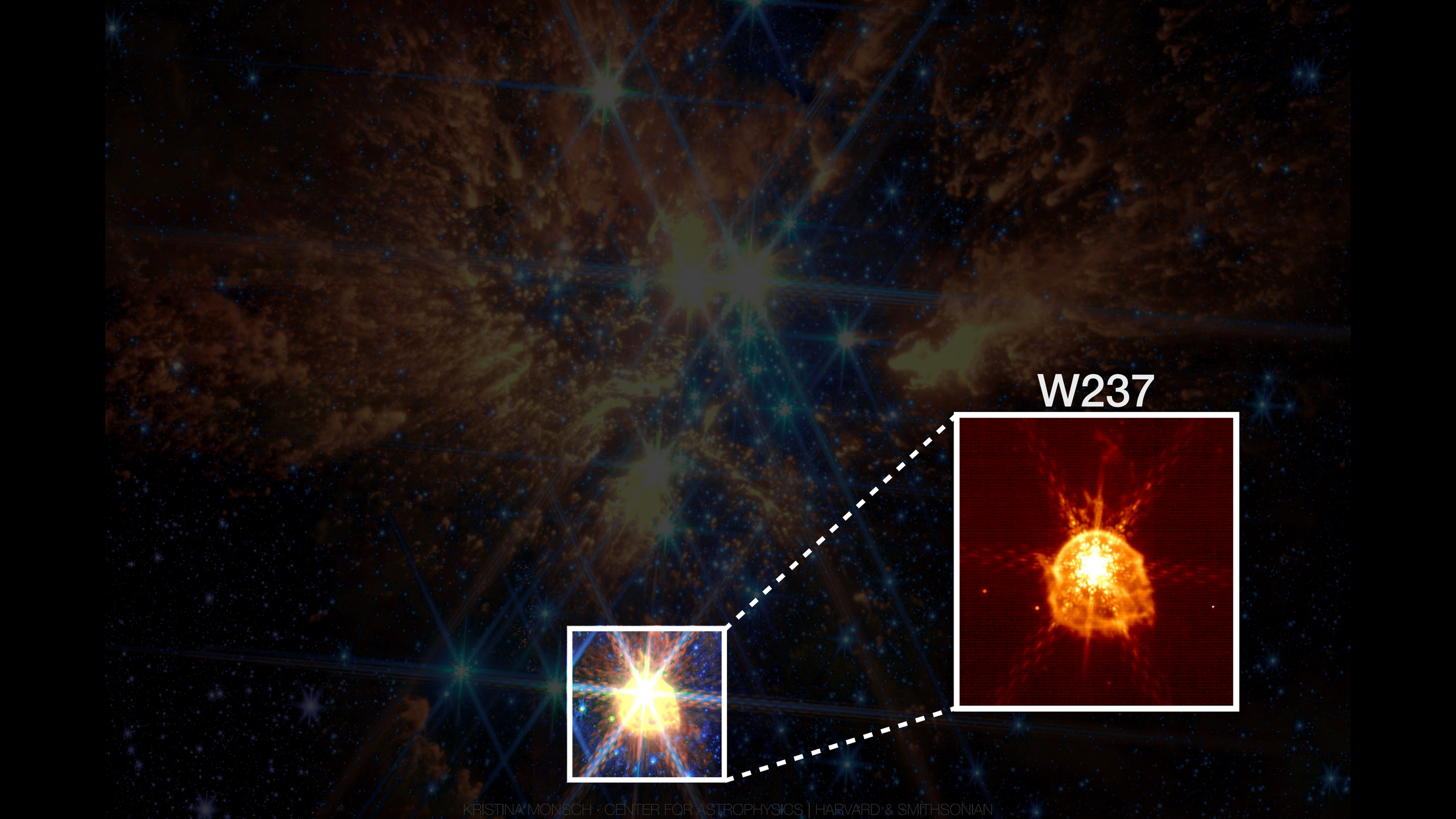


W75



W20




W237

JWST has unveiled an **explosive cosmic fireworks** display of **stars interacting with their environment.**

Due to **powerful winds flowing from the stars** this marks a major milestone in our ability to study the **formation of the largest stars** and to better understand **how they affect their environments.**

Questions? Contact me at kristina.monsch@cfa.harvard.edu

Guarcello et al. (2025), A&A

Press Release

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