

# A 12.4-day periodicity in a close binary system after a supernova

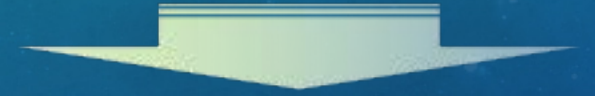
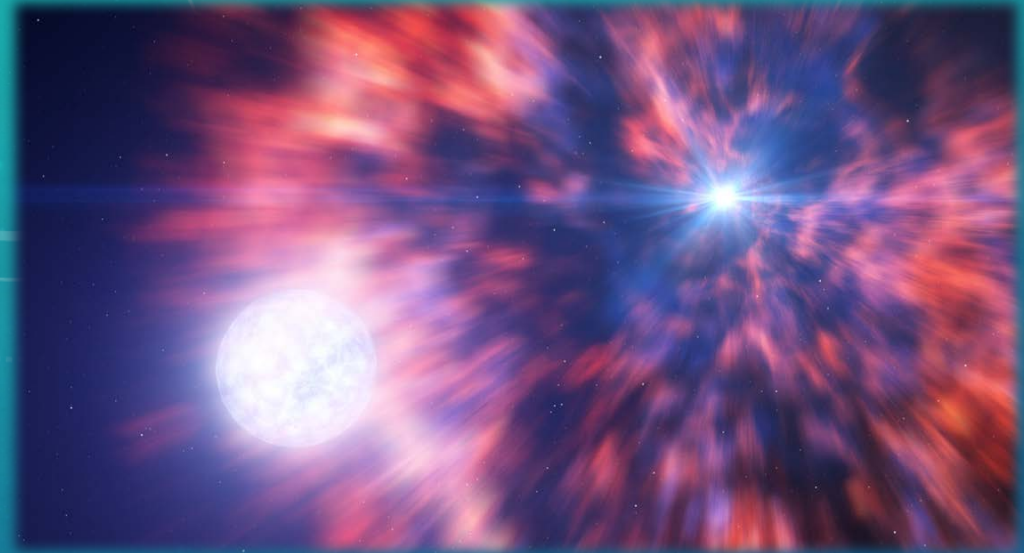
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**Avishay Gal-Yam, Jesper Sollerman, and coauthors**

Thanks to WIS team, ZTF collaborators, and all the other coauthors of Chen et al. 2024!

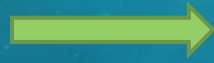
<https://www.nature.com/articles/s41586-023-06787-x>



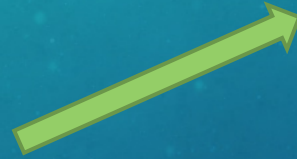
# MASSIVE STAR EXPLOSION



Massive star  
(progenitor)



Supernova (SN) explosion

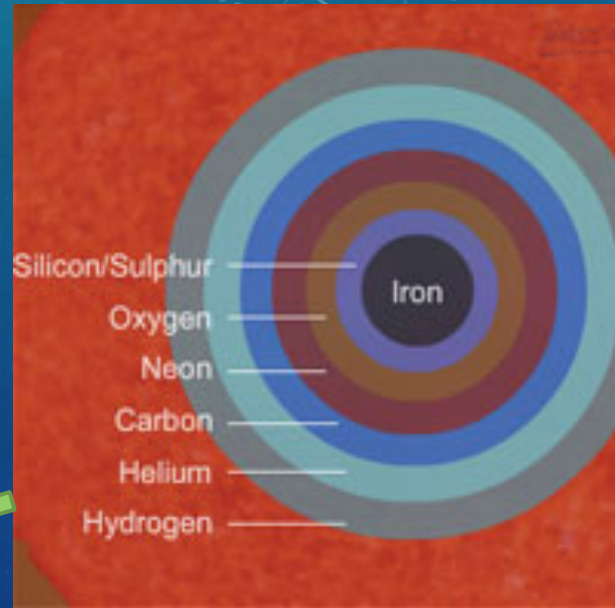
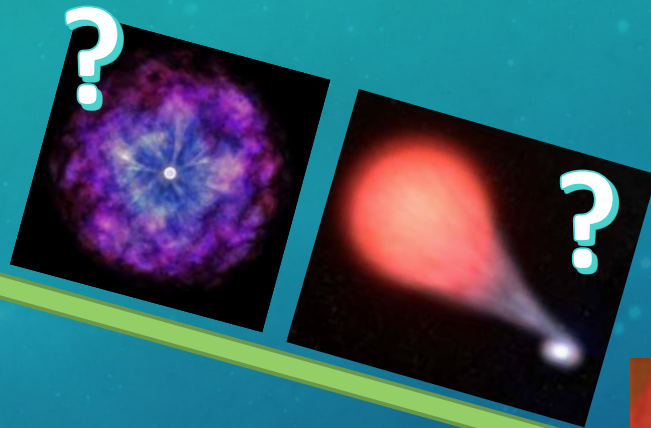
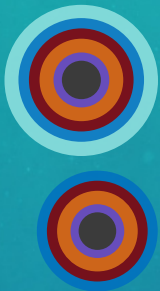
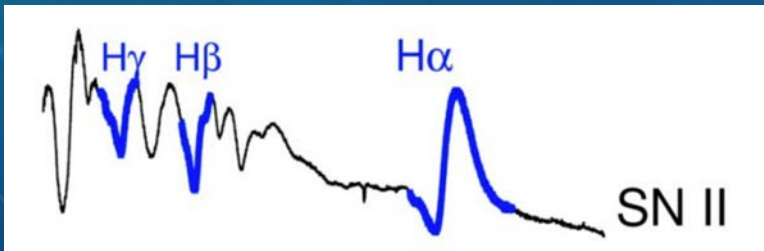


Neutron star



Black hole  
(stellar-mass)

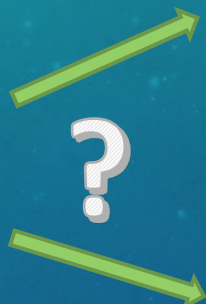
# STRIPPED-ENVELOPE SUPERNOVA



# OBSERVATIONAL EVIDENCE: SUPERNOVA → COMPACT OBJECT



SN explosion



Neutron star



Black hole  
(stellar-mass)

Crab Pulsar & Crab Nebula



NASA/CXC/ASU/J. Hester et al.

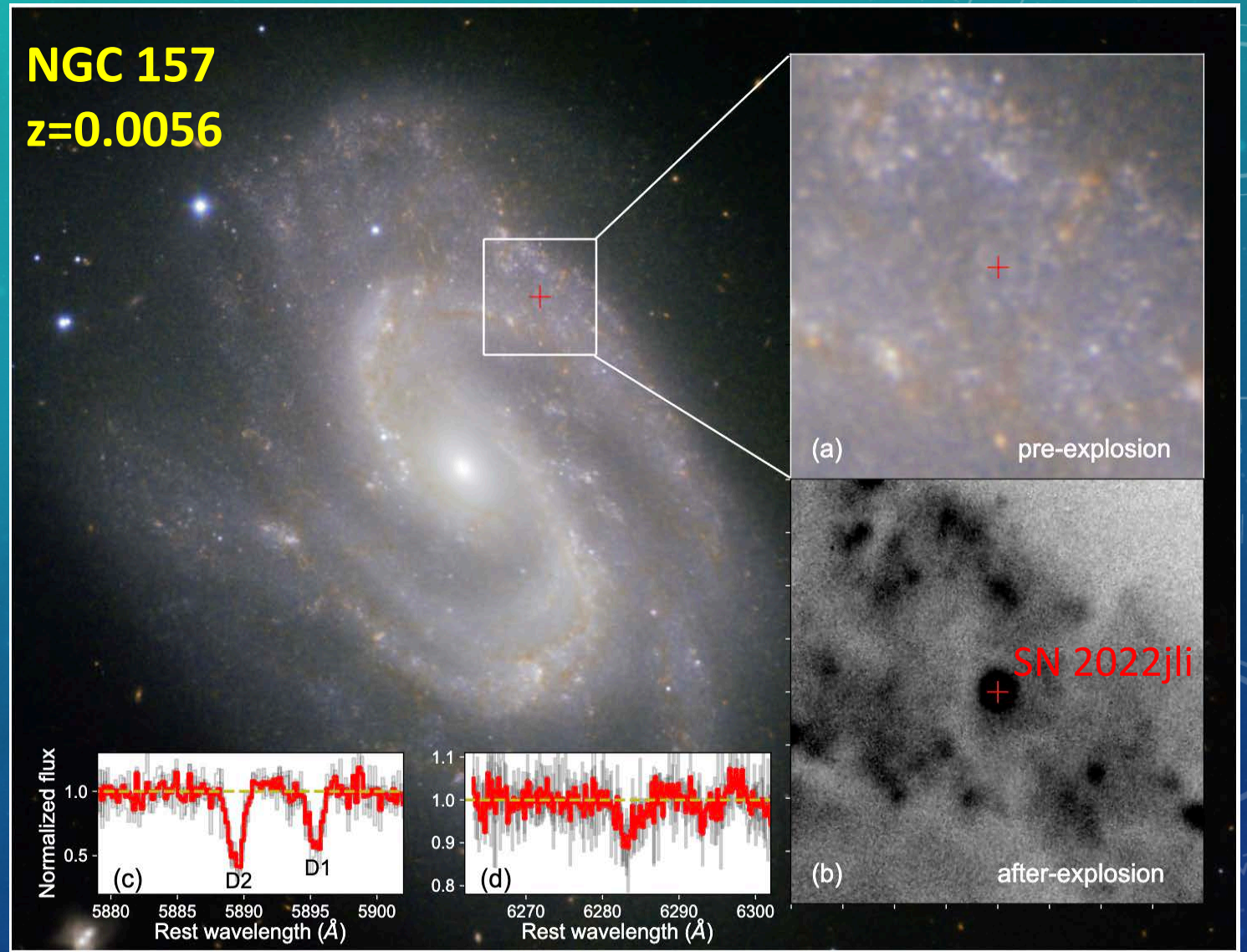
SN 1054



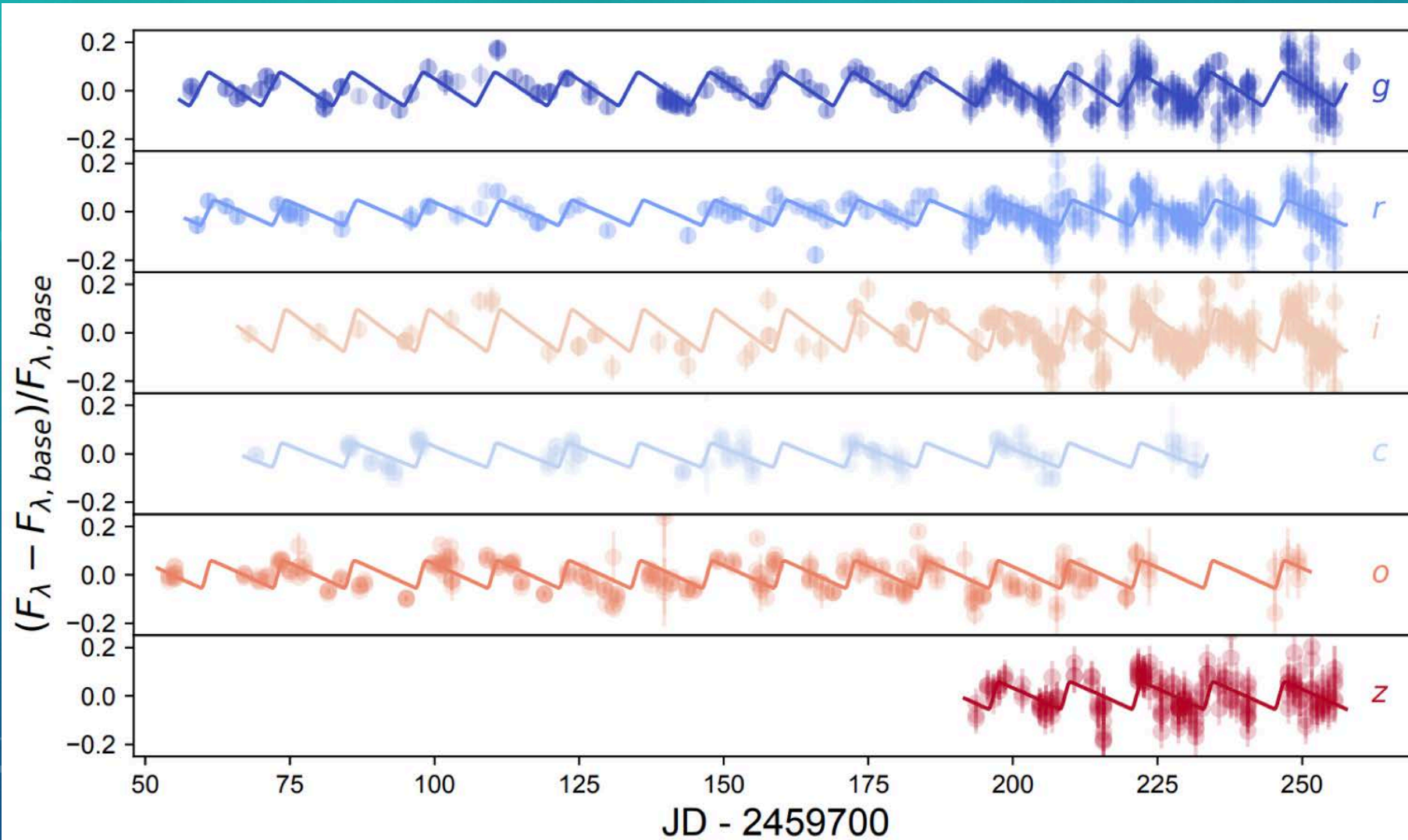
Neutron star

# SN 2022JLI

- Discovered by Libert Monard on 5 May 2022
- Classified as SN Ic shortly after discovery



# PERIODICAL UNDULATION IN THE LIGHT CURVE

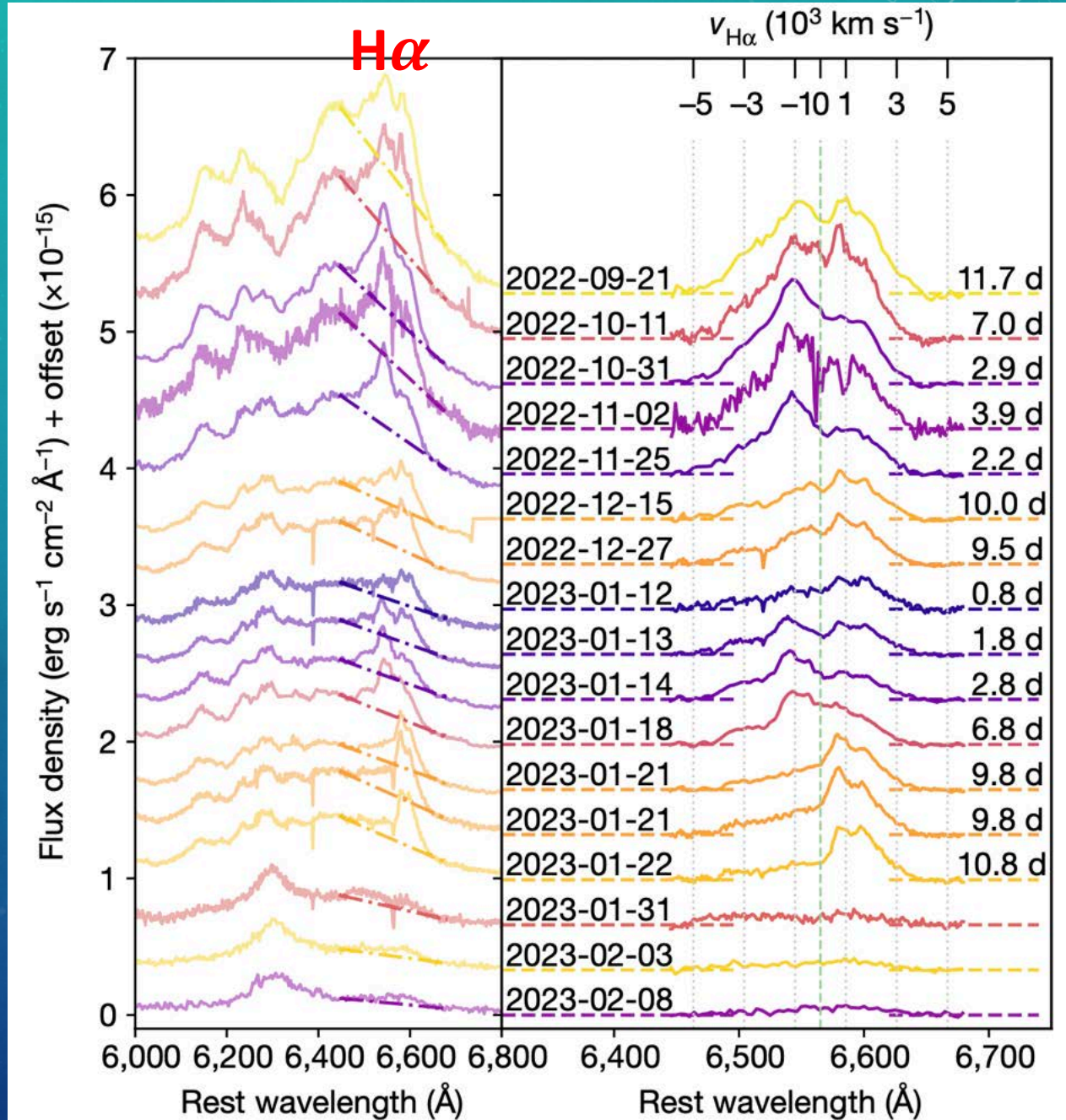


**12.4-day period**  
in multiband  
light curves of  
SN 2022jli

(See also Moore et al. 2023)

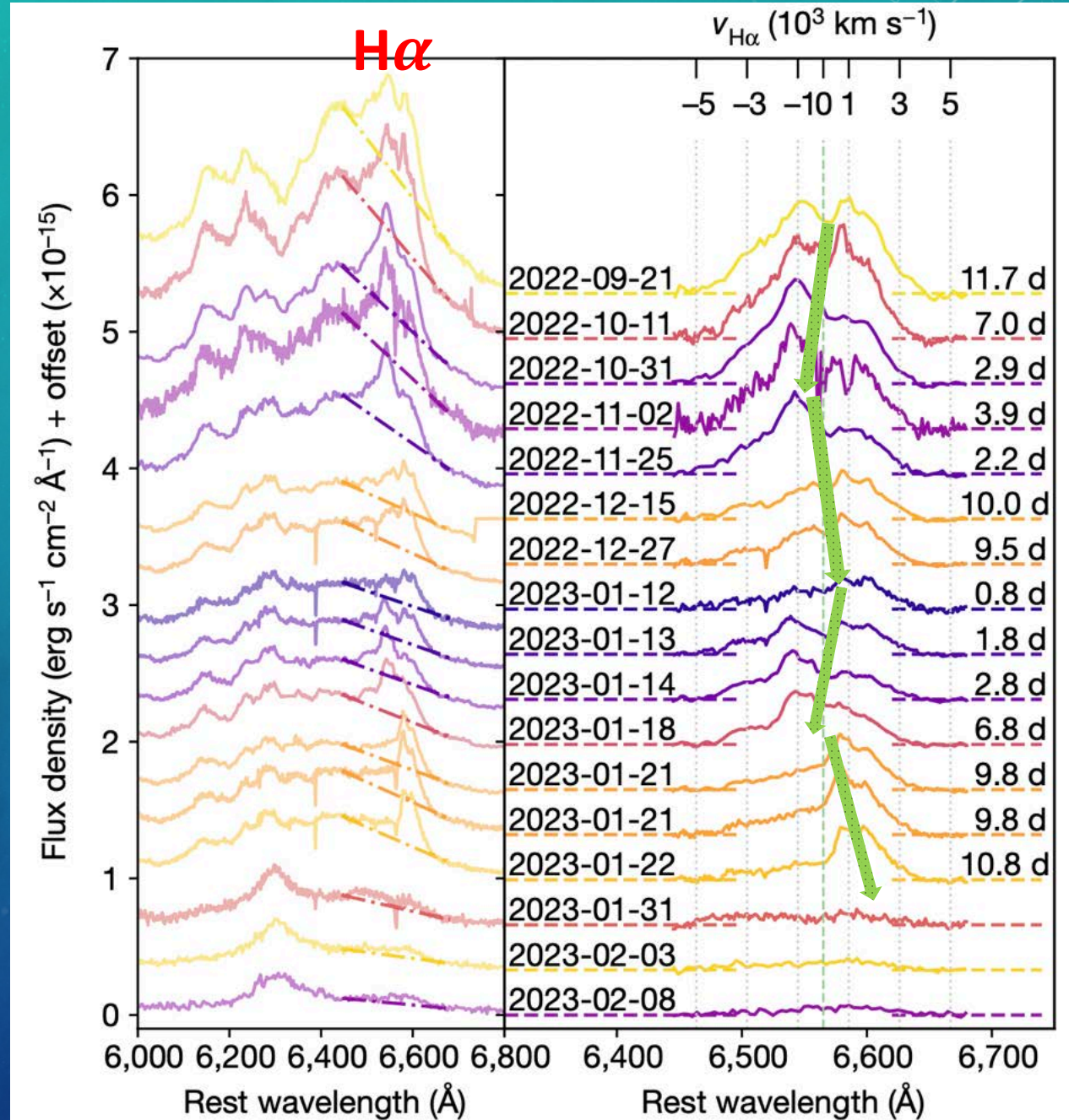
# PERIODICAL SHIFTING OF HYDROGEN EMISSION

- Hydrogen emissions are detected in SN 2022jli during the phase when we see periodical undulation in light curves



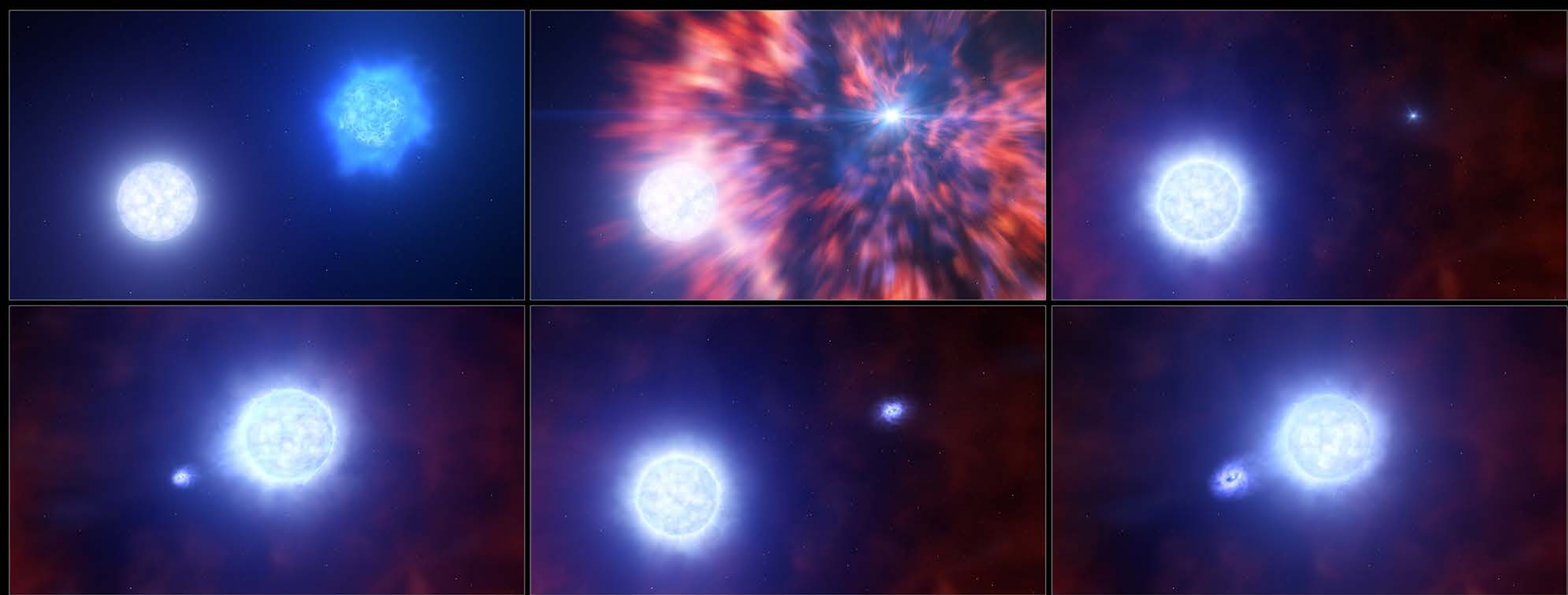
# PERIODICAL SHIFTING OF HYDROGEN EMISSION

- Hydrogen emissions are detected in SN 2022jli during the phase when we see periodical undulation in light curves
- The wavelength of the Hydrogen emission line is shifting





# COMPACT OBJECT FORMATION FROM A SUPERNOVA IN A BINARY SYSTEM



# MAIN RESULTS

- **Direct evidence of stripped envelope supernova happening in binary system**  
→ **binary interaction contribute to mass stripping of the progenitor star**
- **New evidence for the link between supernova explosion and the formation of compact object**
- **Implication in our understanding of binary evolution and formation of double compact object → progenitor of double compact object**

# CONTACT INFORMATION

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