Supernova Polarization and the Type IIn Classification

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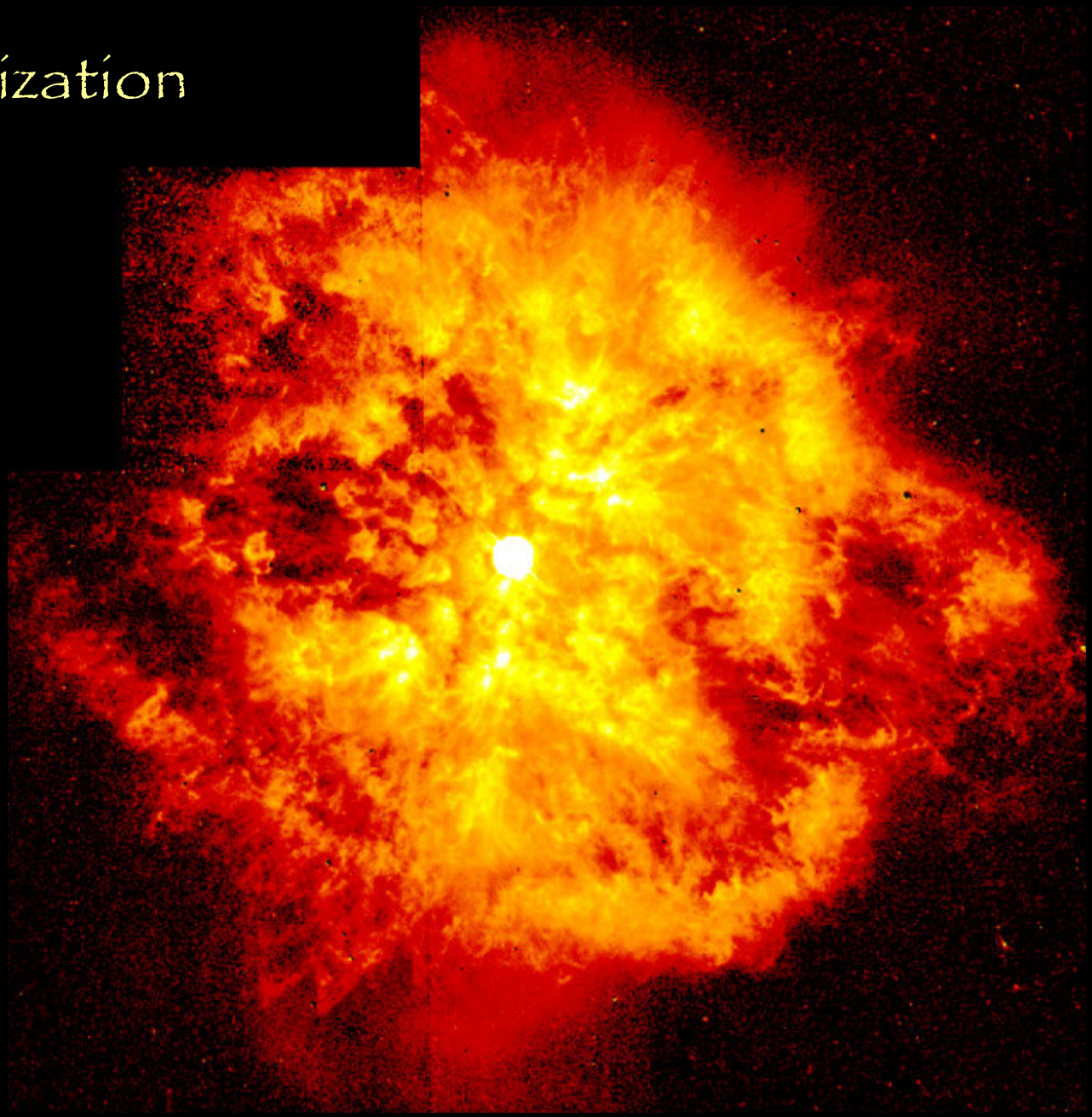
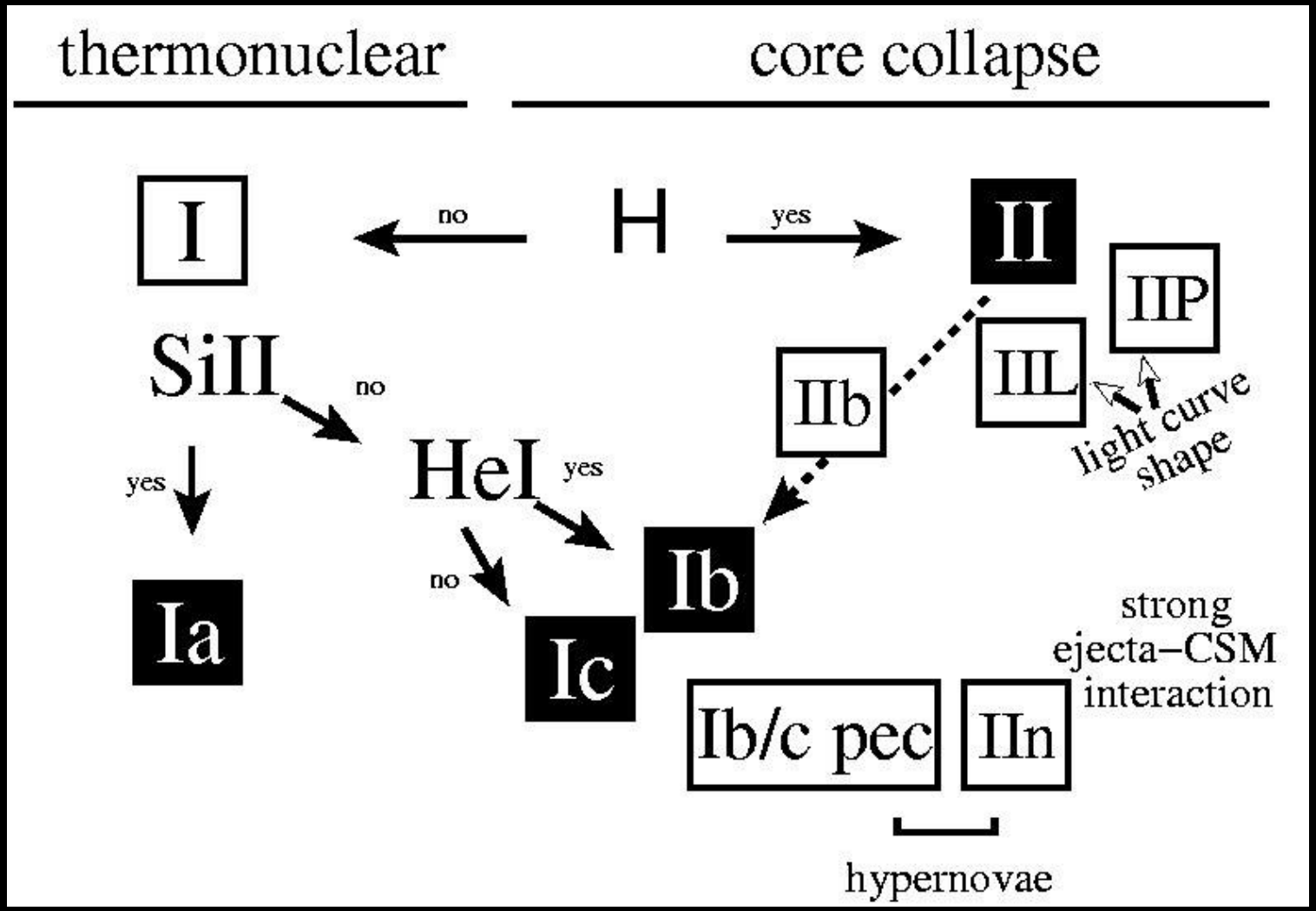


WR 124: Grosdidier/Moffat/Joncas/Acker/NASA

Type IIn supernovae are thought to be core-collapse objects with strong circumstellar interaction.



Turatto 2003

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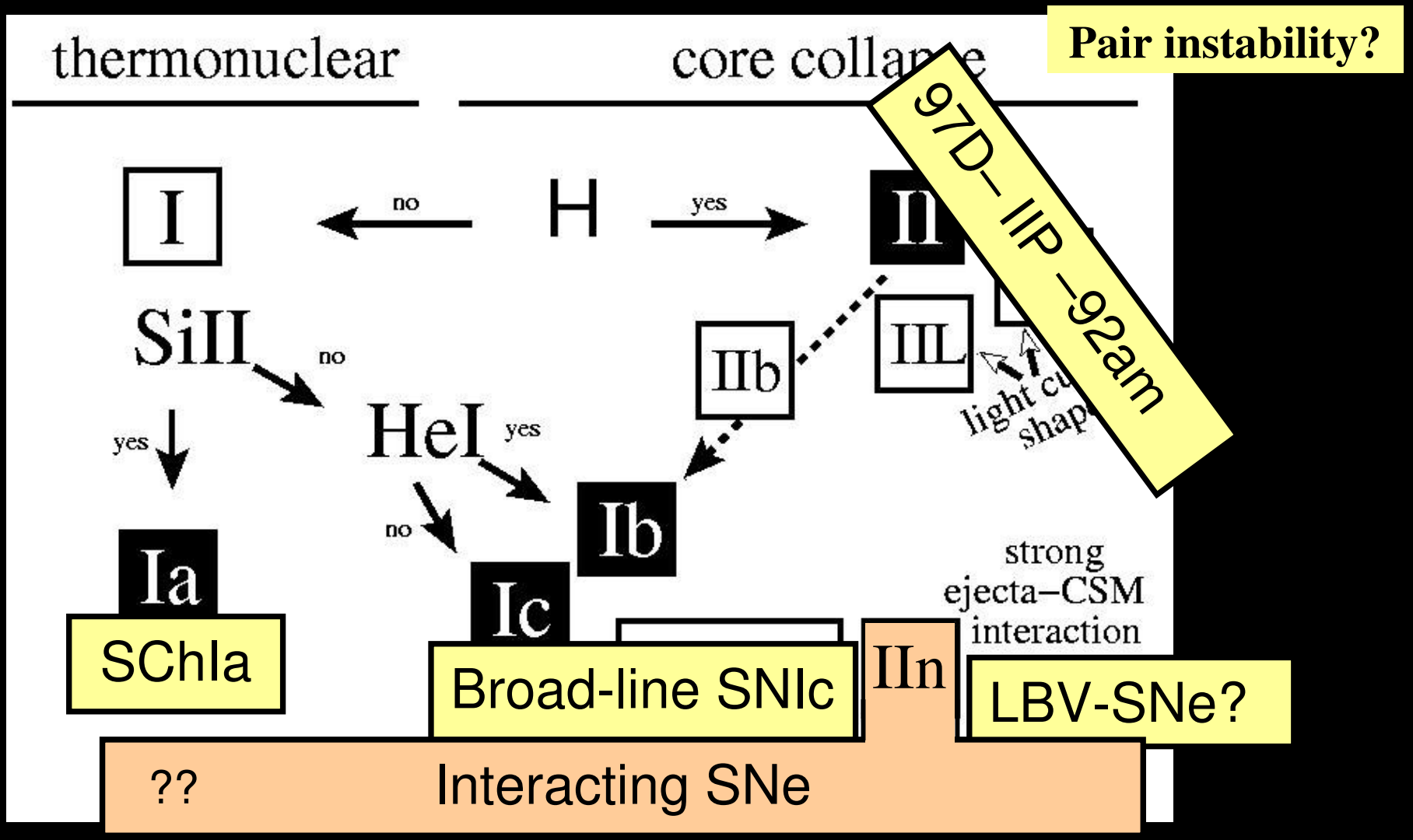
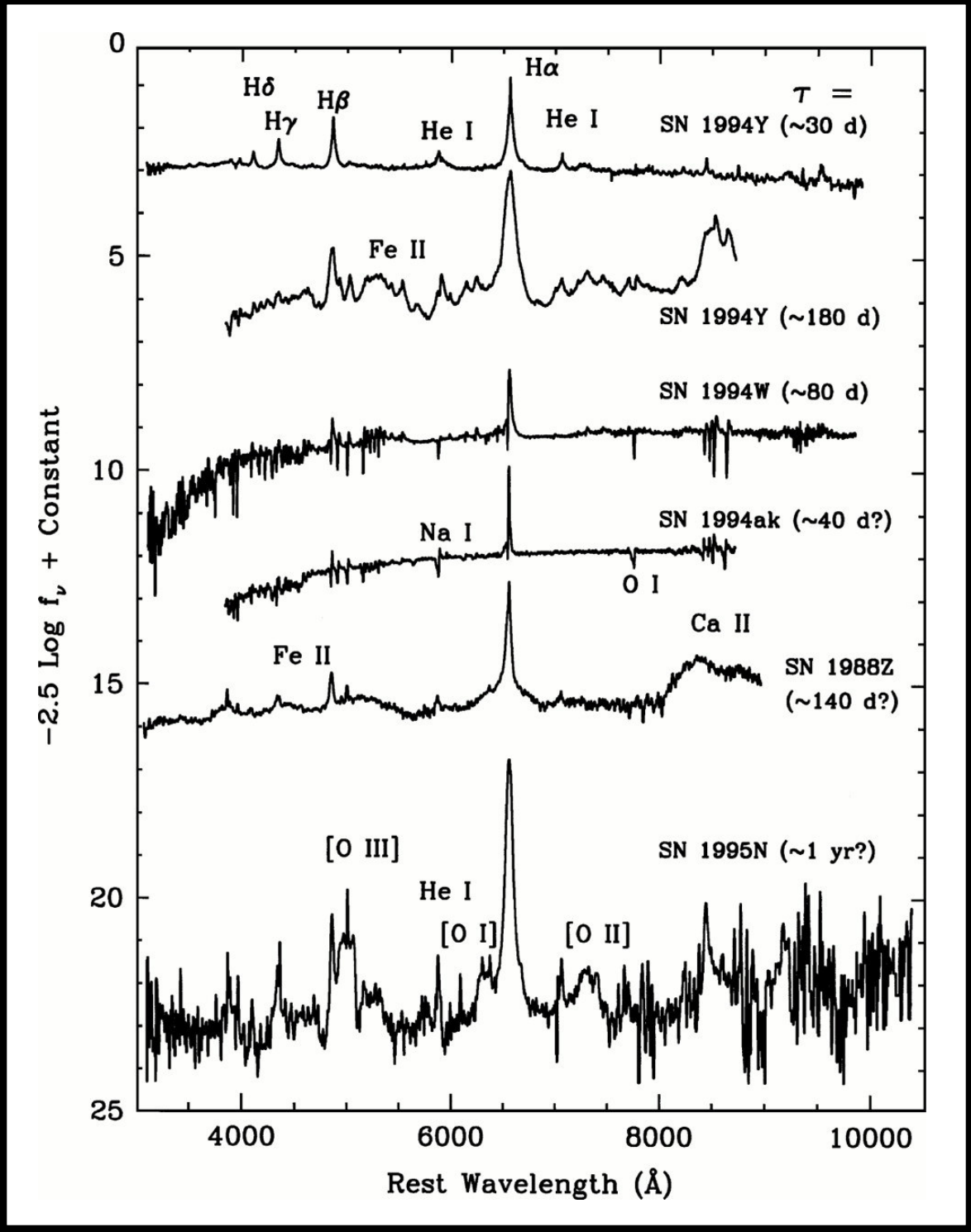


Turatto 2007
(this meeting)

SNe IIn are characterized primarily by strong narrow hydrogen Balmer emission lines.

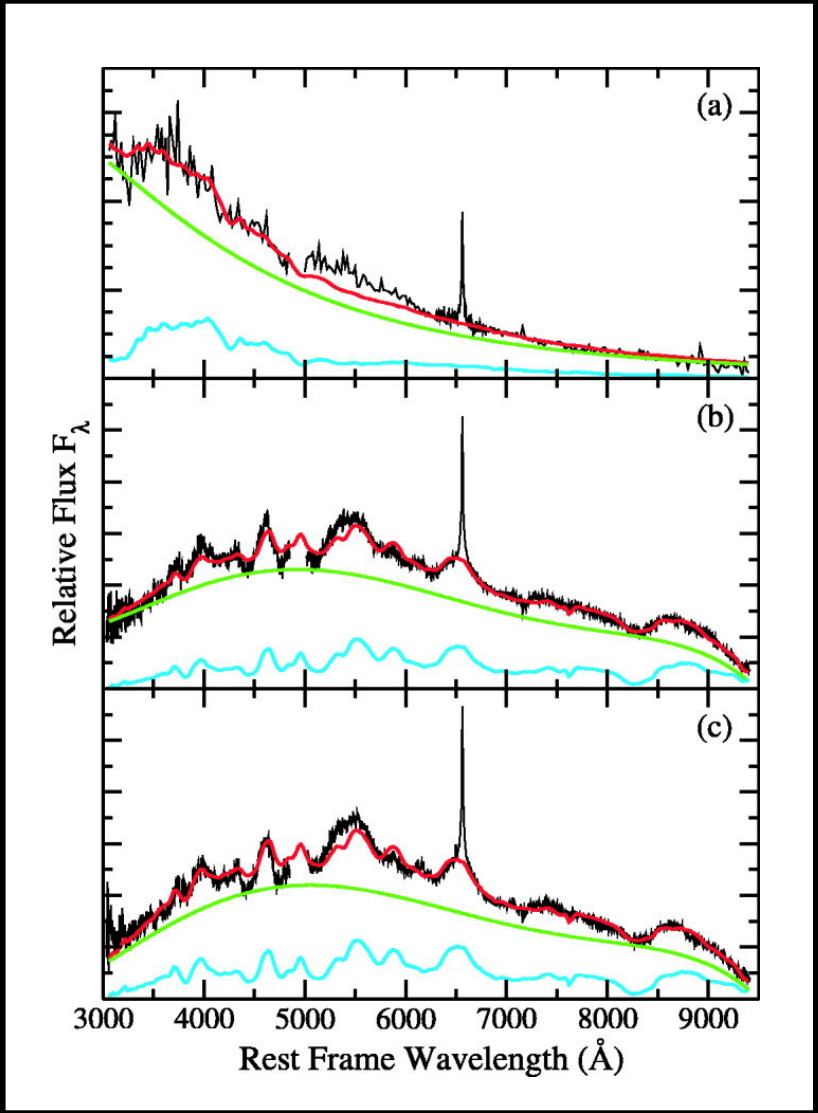
But the category is quite heterogeneous.

For example, not all IIn spectra look the same.

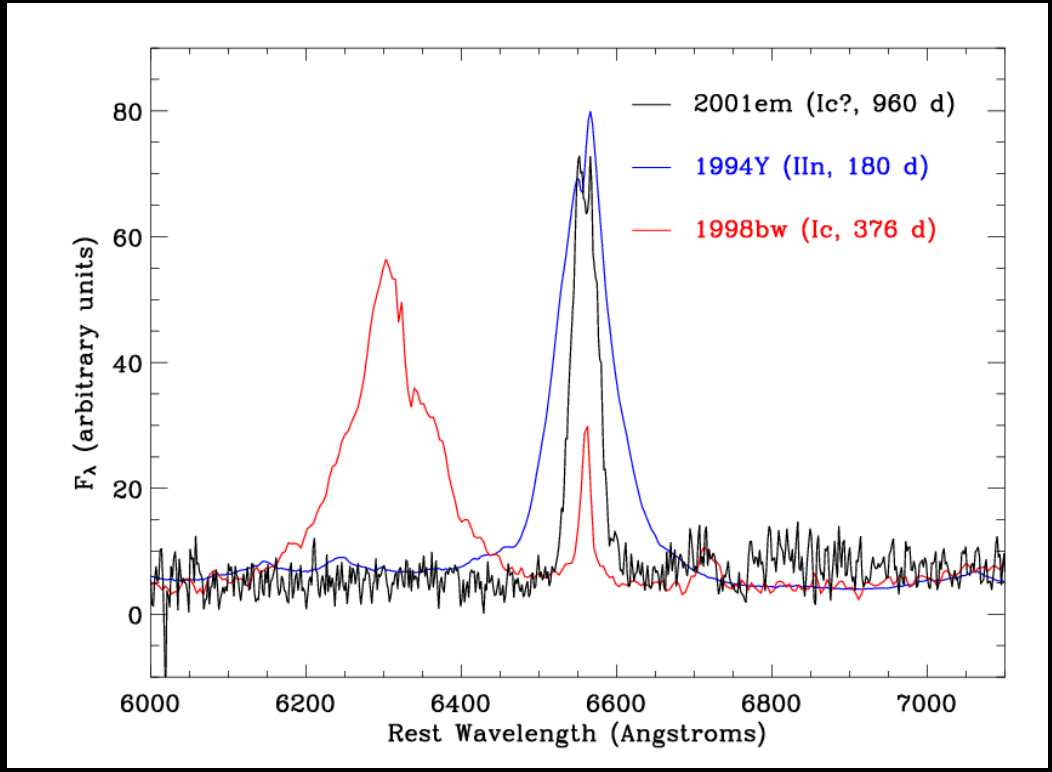


Filippenko 1997

Some IIn's are "hybrids," or change over time from one type to another.

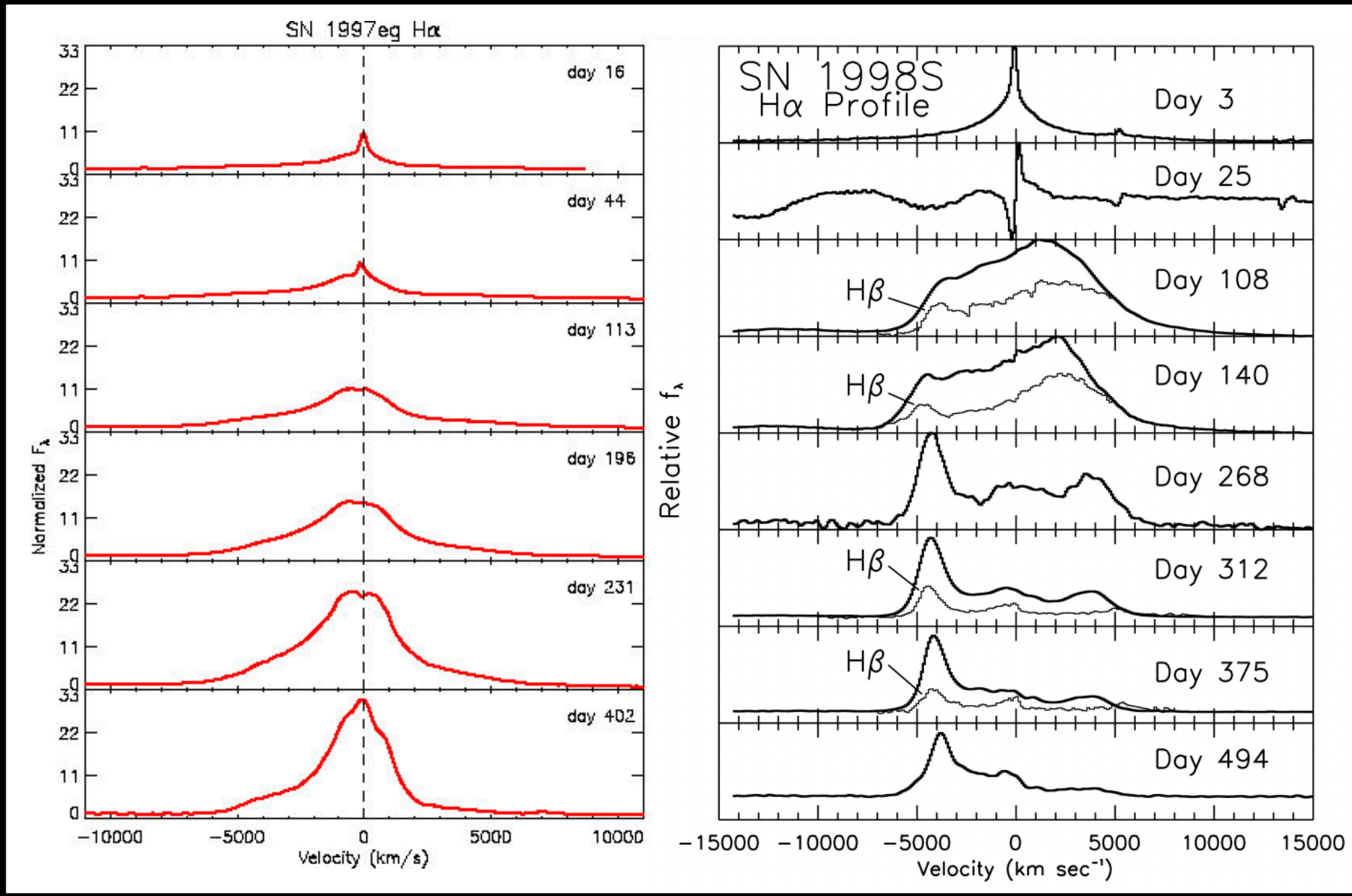


2005gj; Aldering et al. 2006



2001em; Soderberg et al. 2004

Balmer line shapes differ over time and between objects.



Hoffman et al. 2007

Leonard et al. 2000

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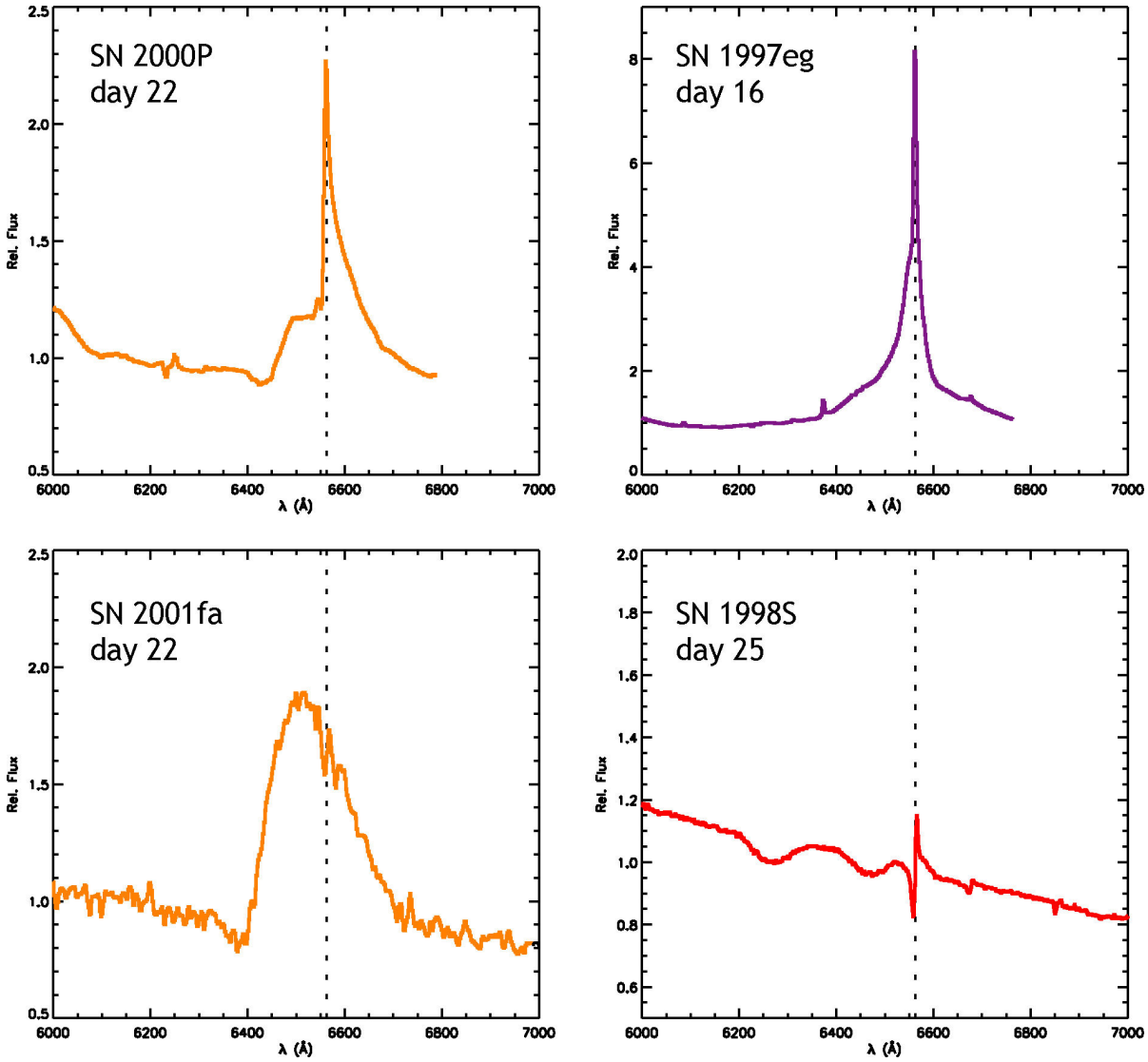
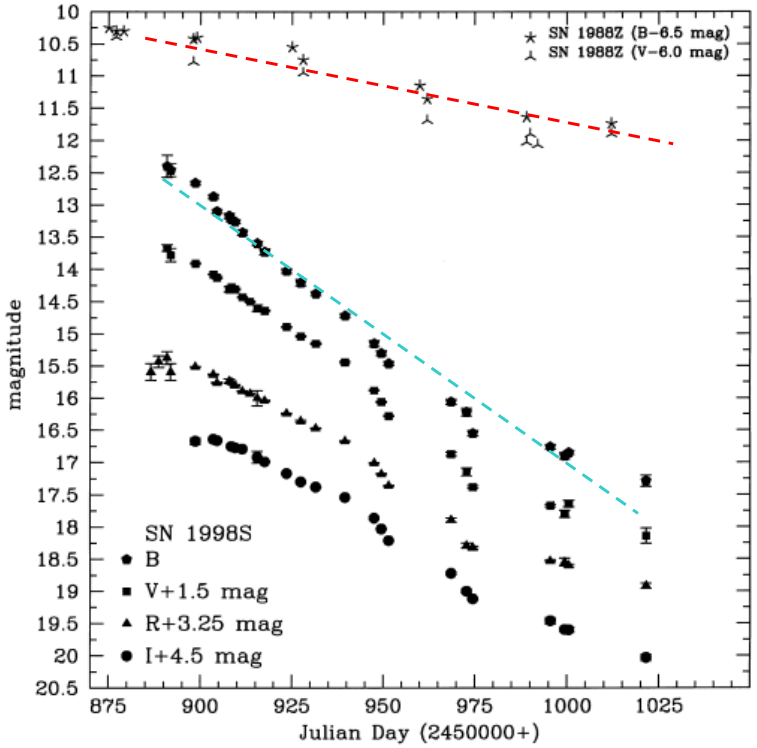


Hoffman et al. 2007

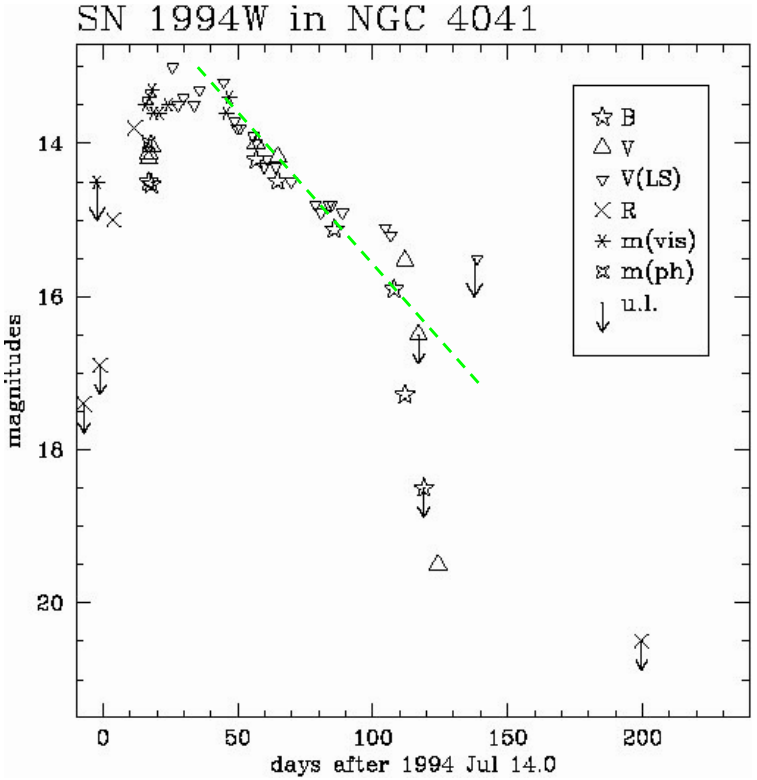
Leonard et al. 2000

Filippenko, priv. comm.

Light curves, radio and X-ray behavior are also quite diverse.



Fassia et al. 2000



Cumming & Lundqvist 1997

Light curves, radio and X-ray behavior are also quite diverse.

Detected in X-rays:

SN 1988Z

SN 1978K

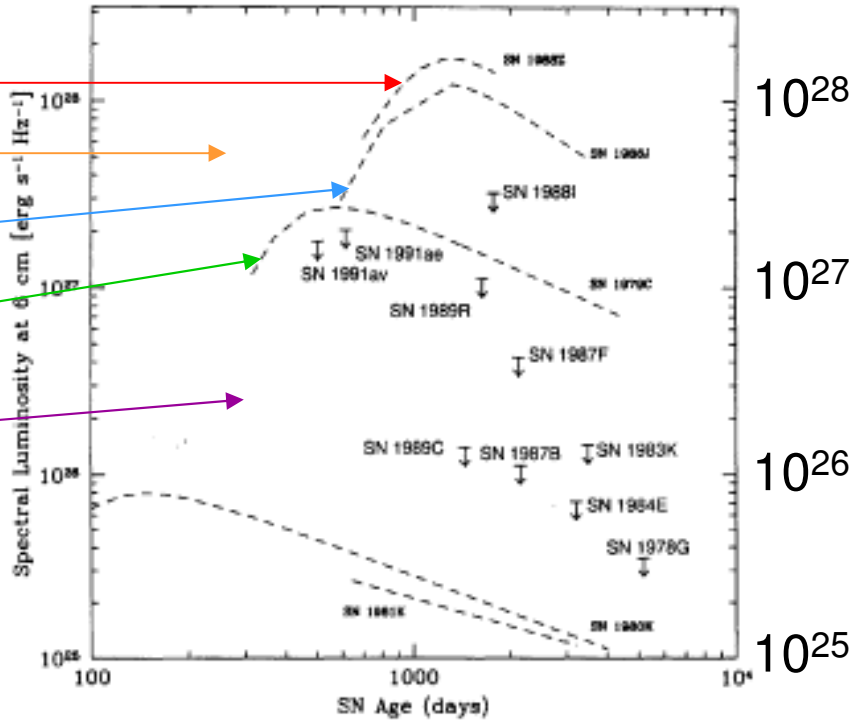
SN 1986J

SN 1979C

SN 1998S

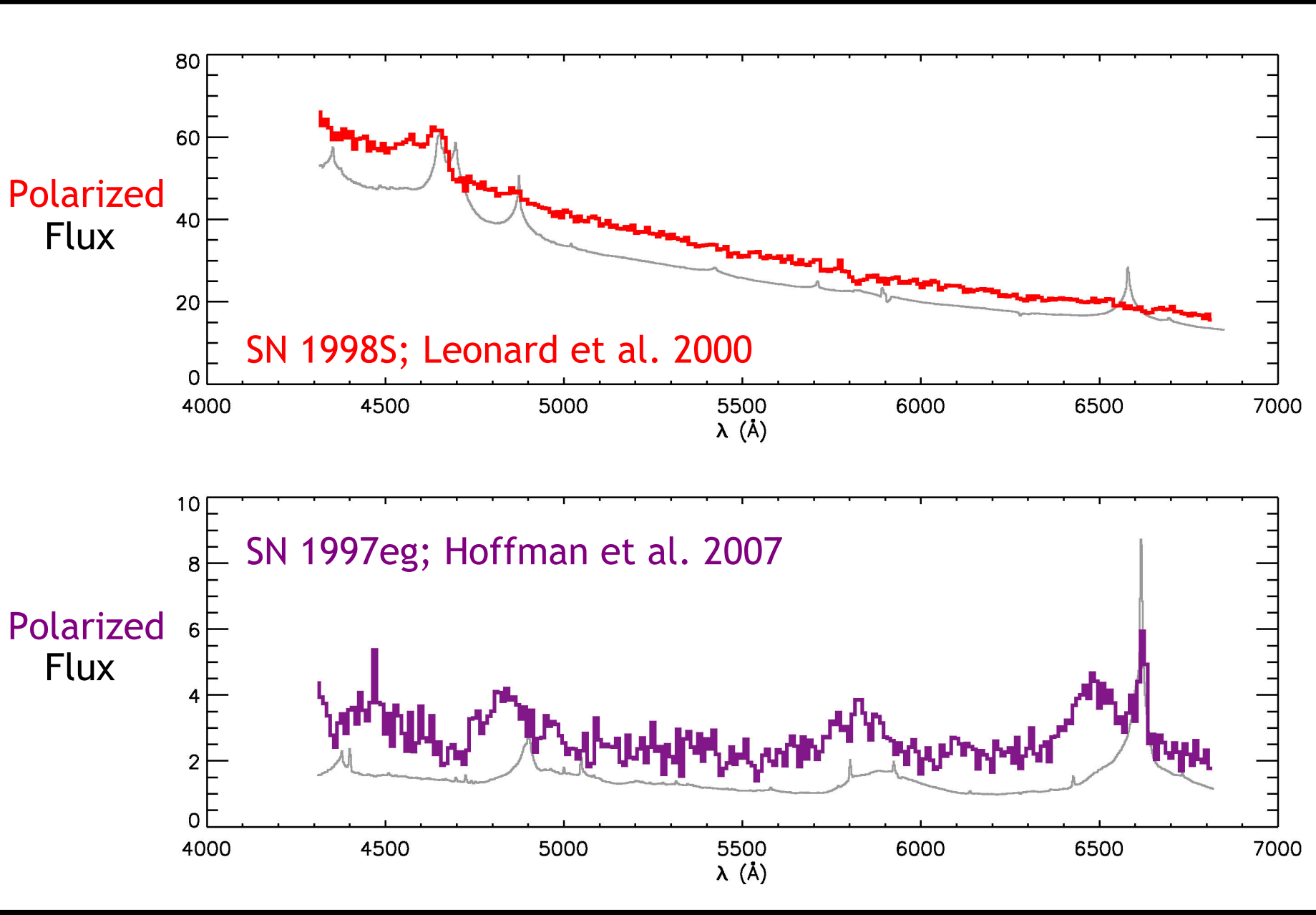
SN 1995N

Detected in radio (6 cm):

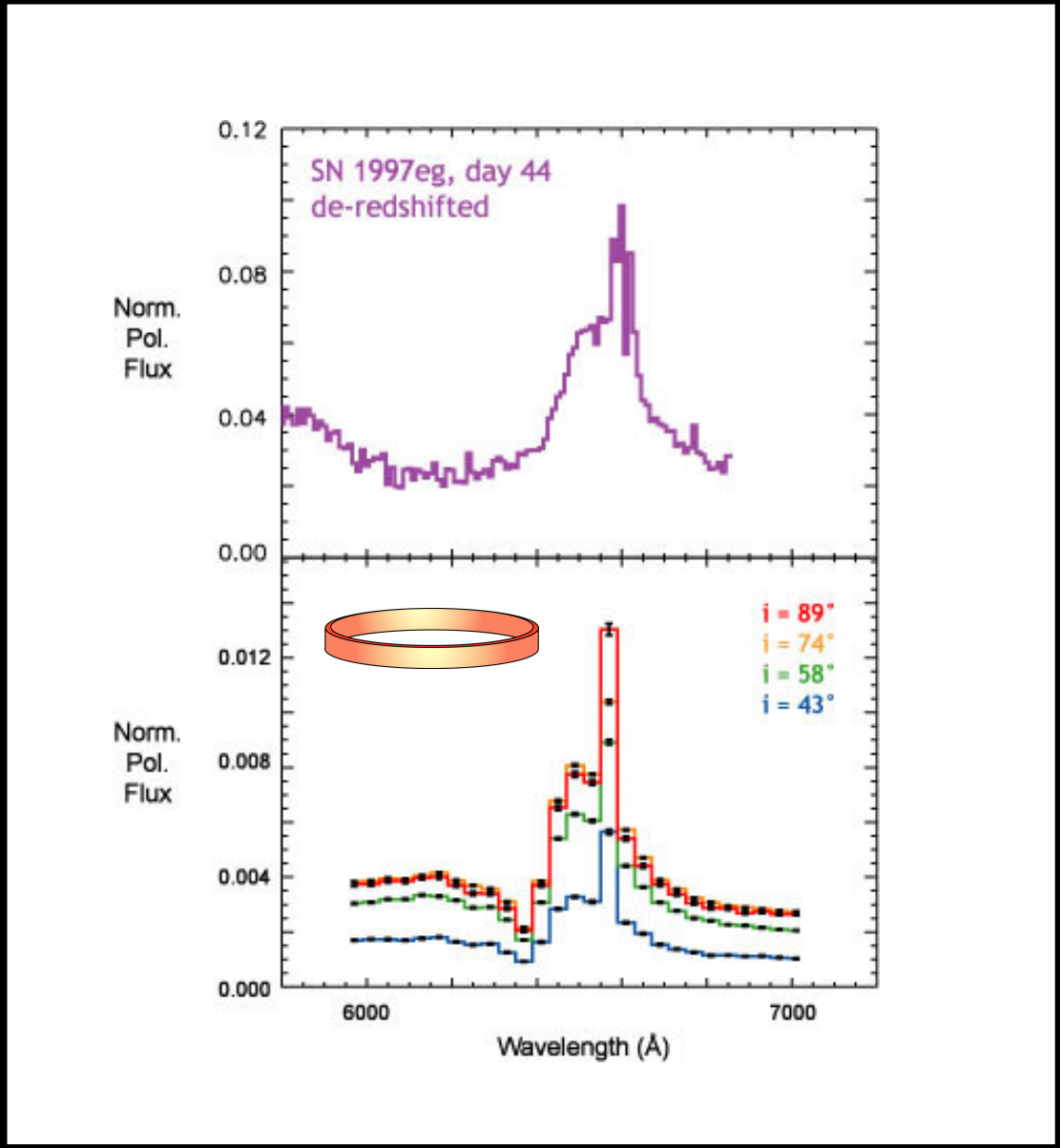


Van Dyk et al. 1996

Polarization spectra of IIn's also vary widely.

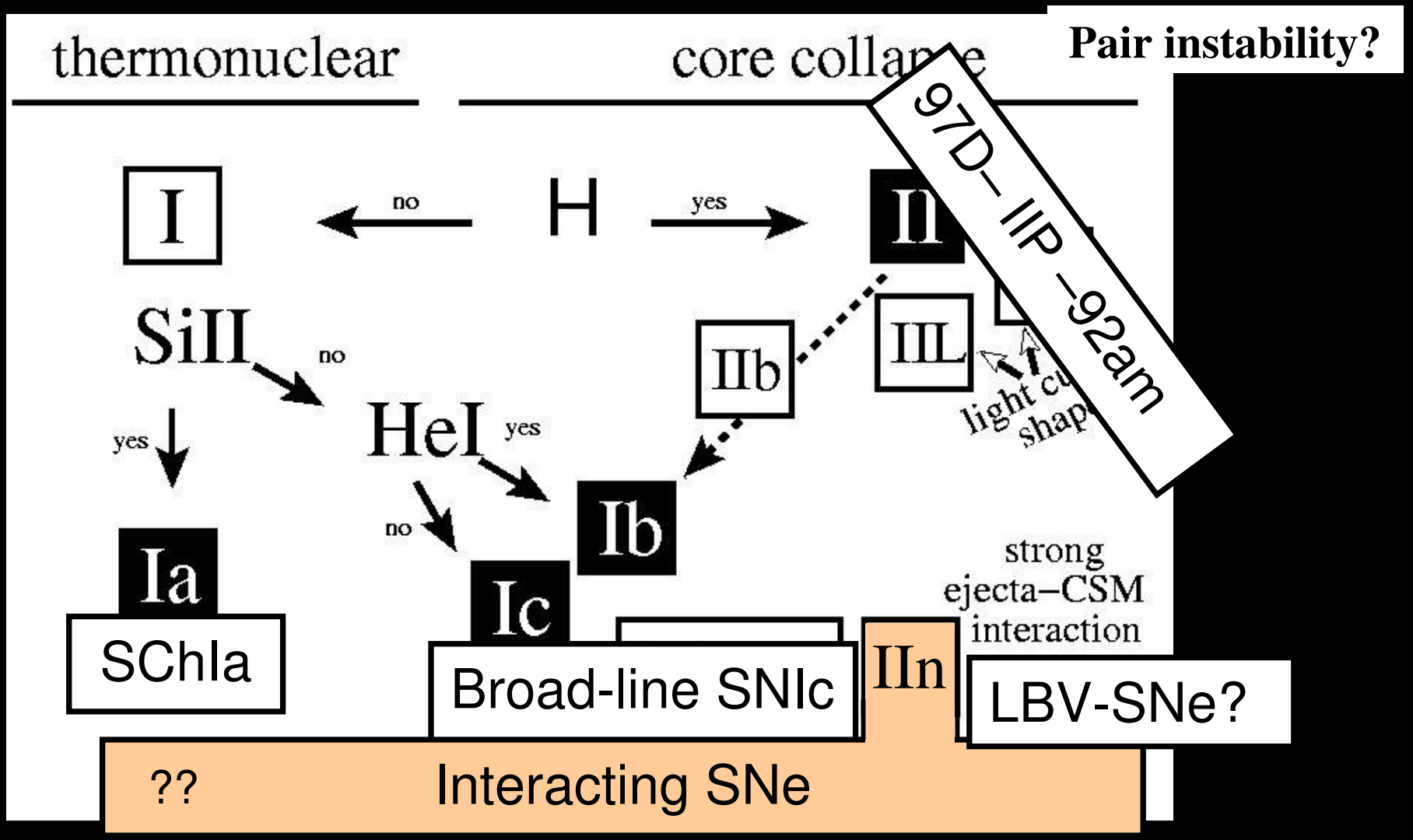


Differences between polarized line profiles of IIn's may be due in part to aspherical CSM distributions viewed at different inclination angles.



Hoffman 2007

Future prospects: Can we subdivide the IIn's/interacting SNe?



Turatto 2007

Future prospects: Can we subdivide the IIn's/interacting SNe?

For archival data (in progress):

- Quantify spectral and polarimetric behavior.
- Look for correlations with light curves and radio/X-ray data.
- Use models to investigate viewing angle effects.

For new SNe:

- Get more data!
  Multiwavelength, polarimetric, time-dependent, …

Expand collaborations with the evolved-star community.