
Superluminous
Supernovae
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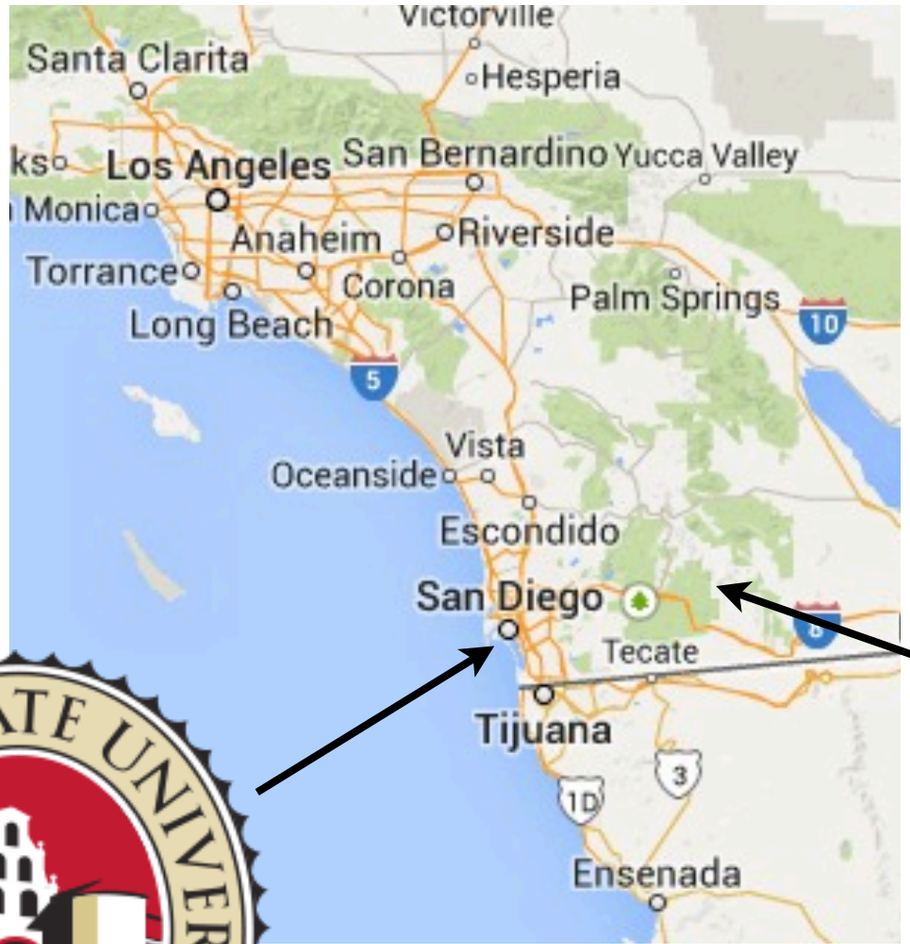
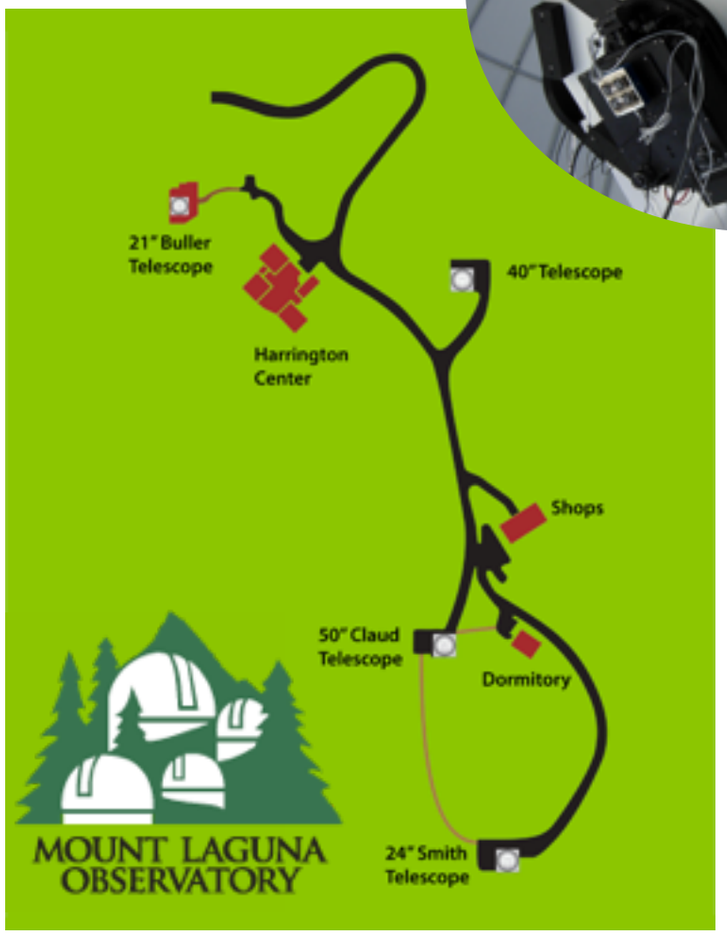
KAVLI
IPMU

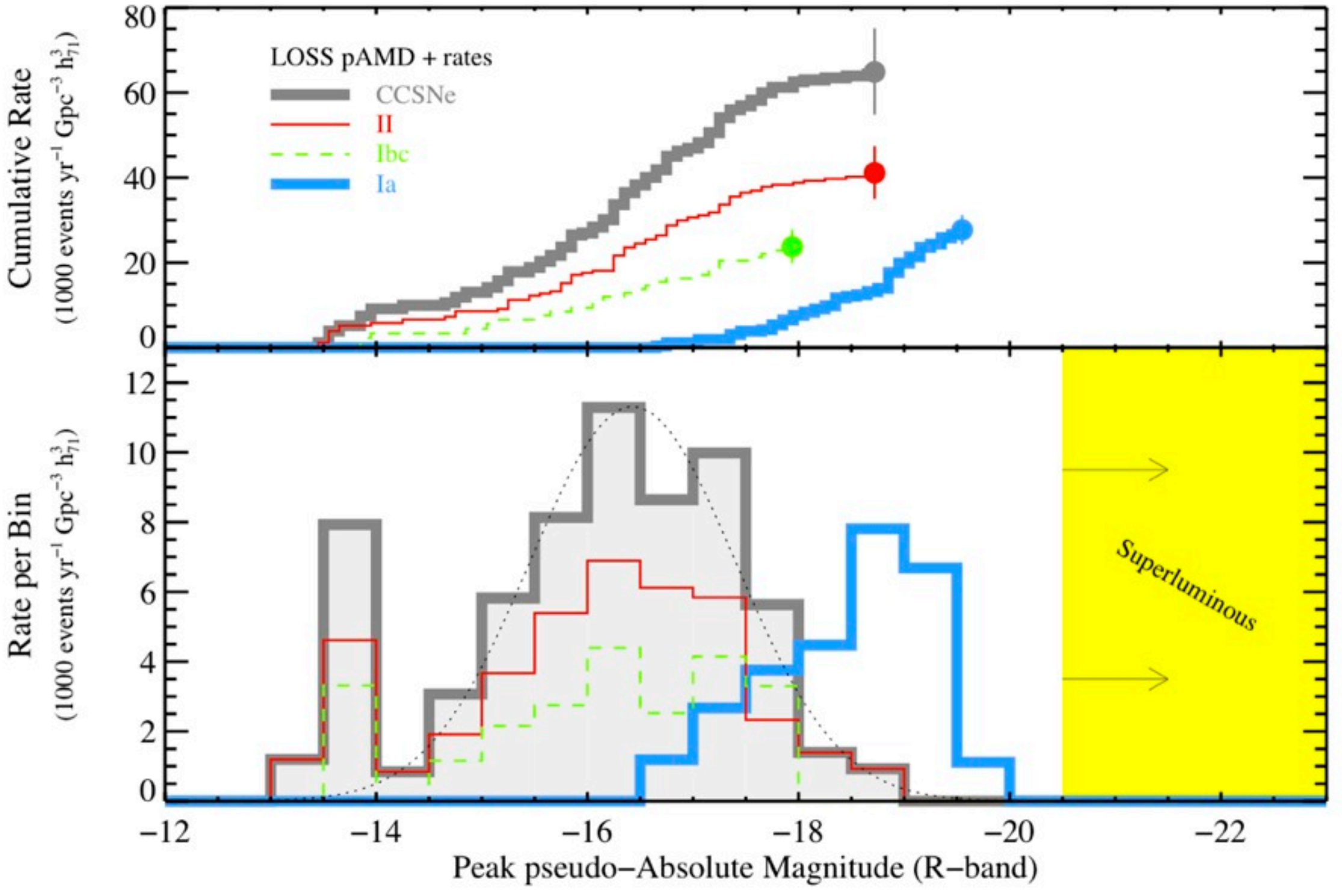
I'm Moving to SDSU From September



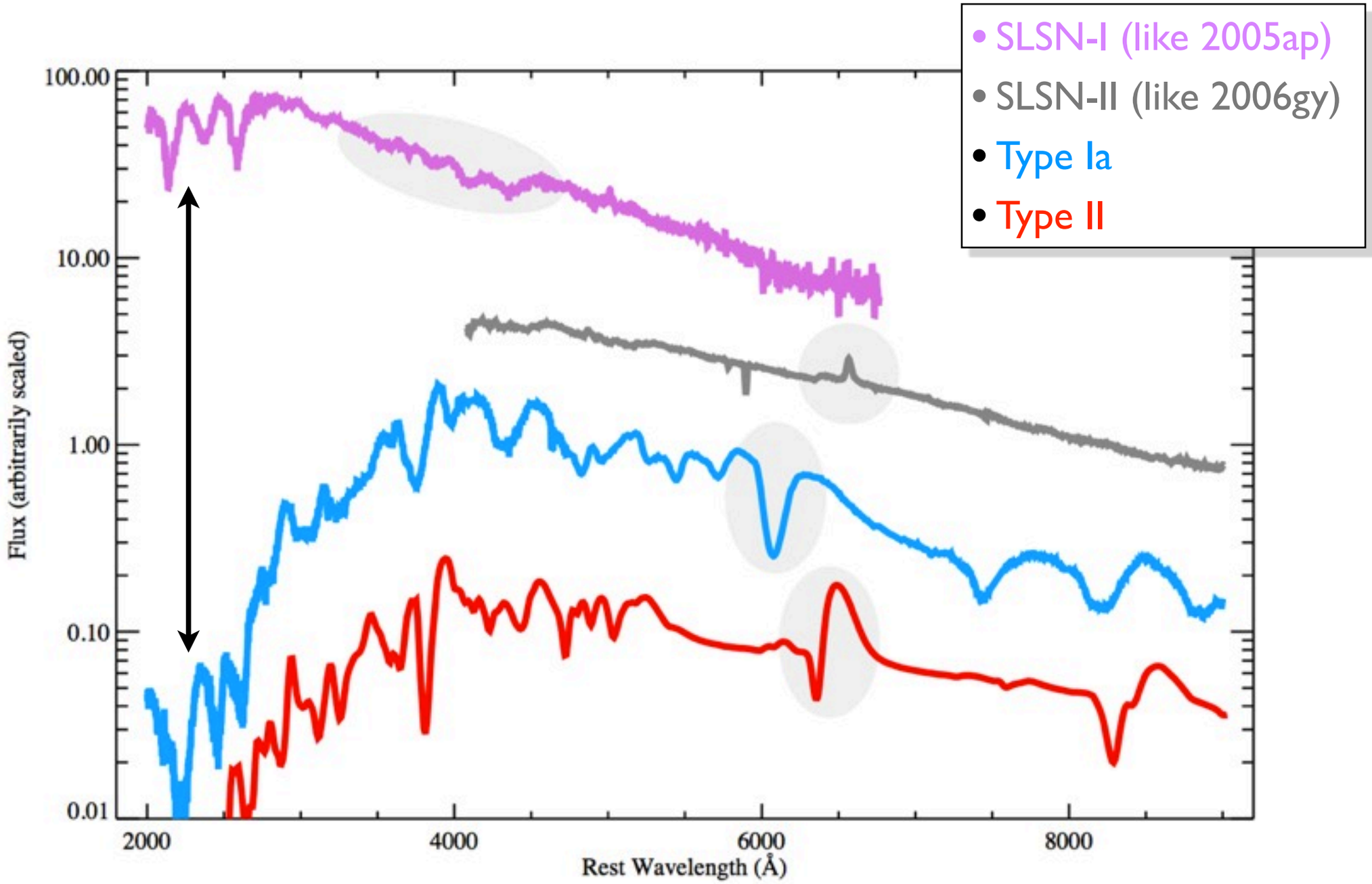


Absolute Magnitude Distributions of Supernovae

Data from LOSS (Li et al. 2011)

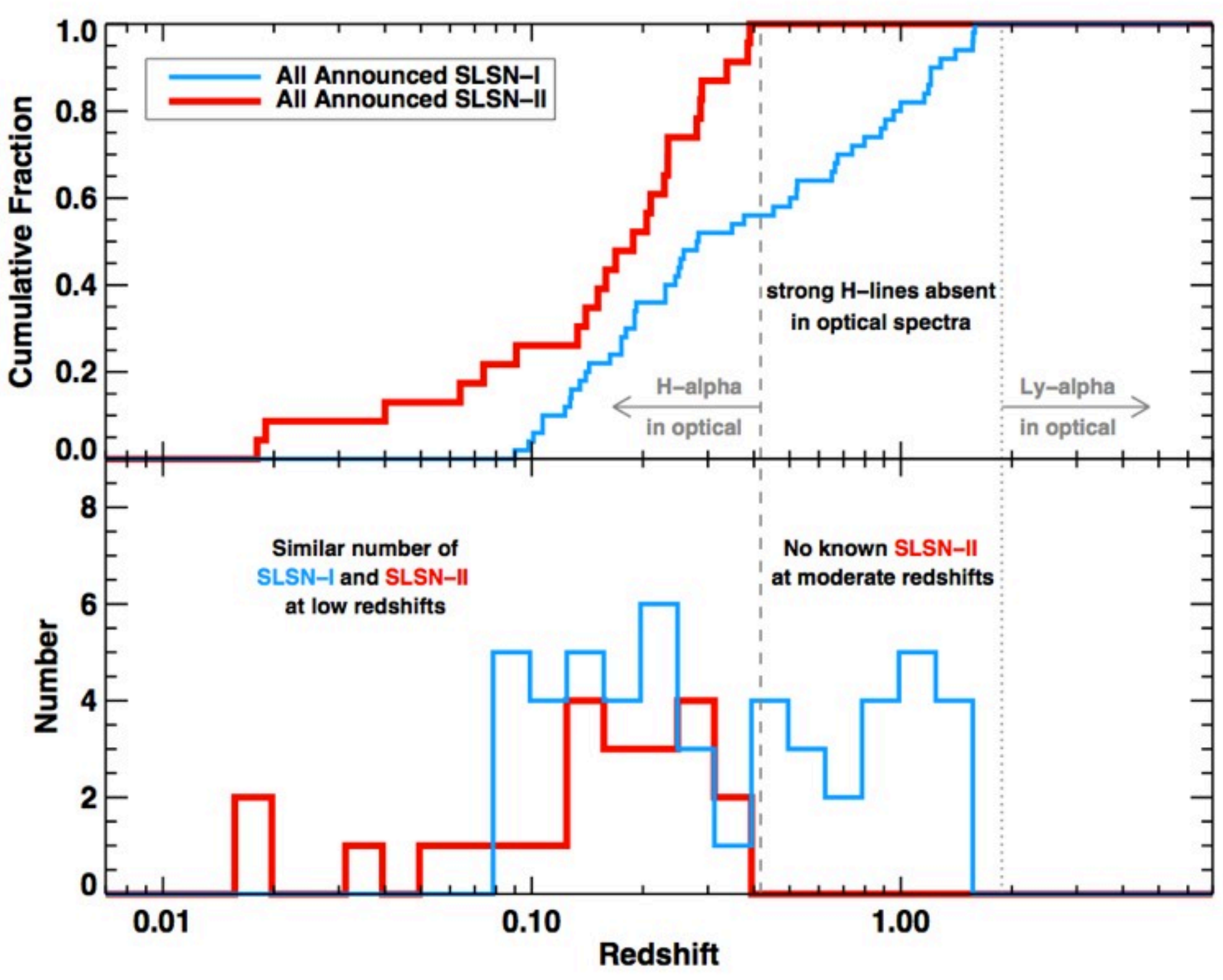


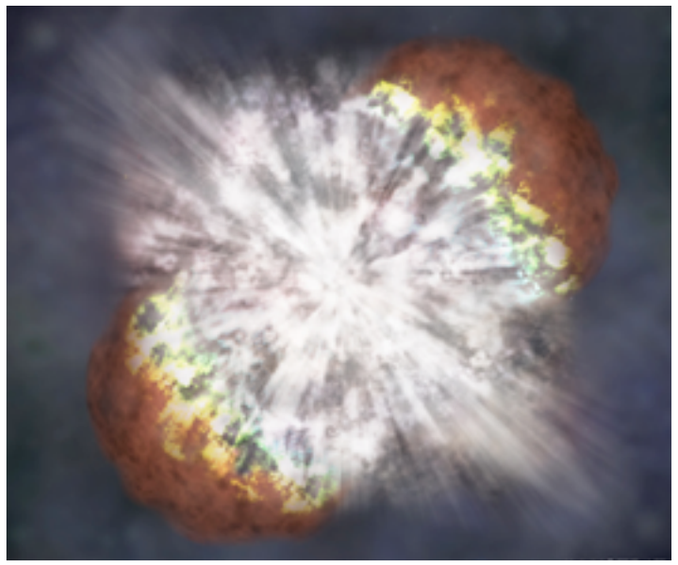
SLSN Spectra



Hundreds of times brighter than SNIa in the UV!

Redshift Distributions of SLSN-I and SLSN-II





What are SLSNe Physically?

Three possibilities under consideration:

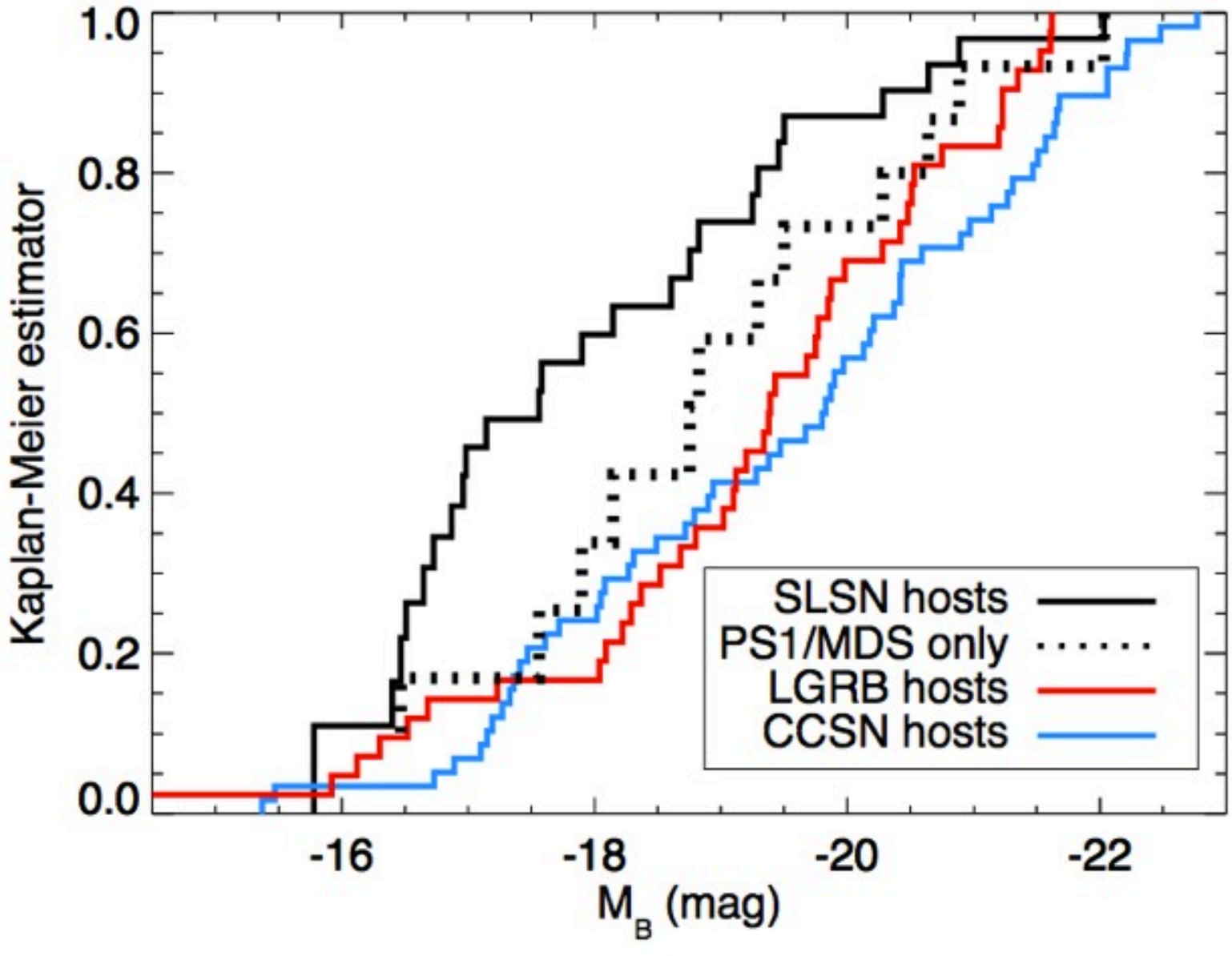
1) Pair Instability supernovae?

2) Supernovae powered by ejecta/wind interaction?

3) Supernovae powered by a compact remnant?

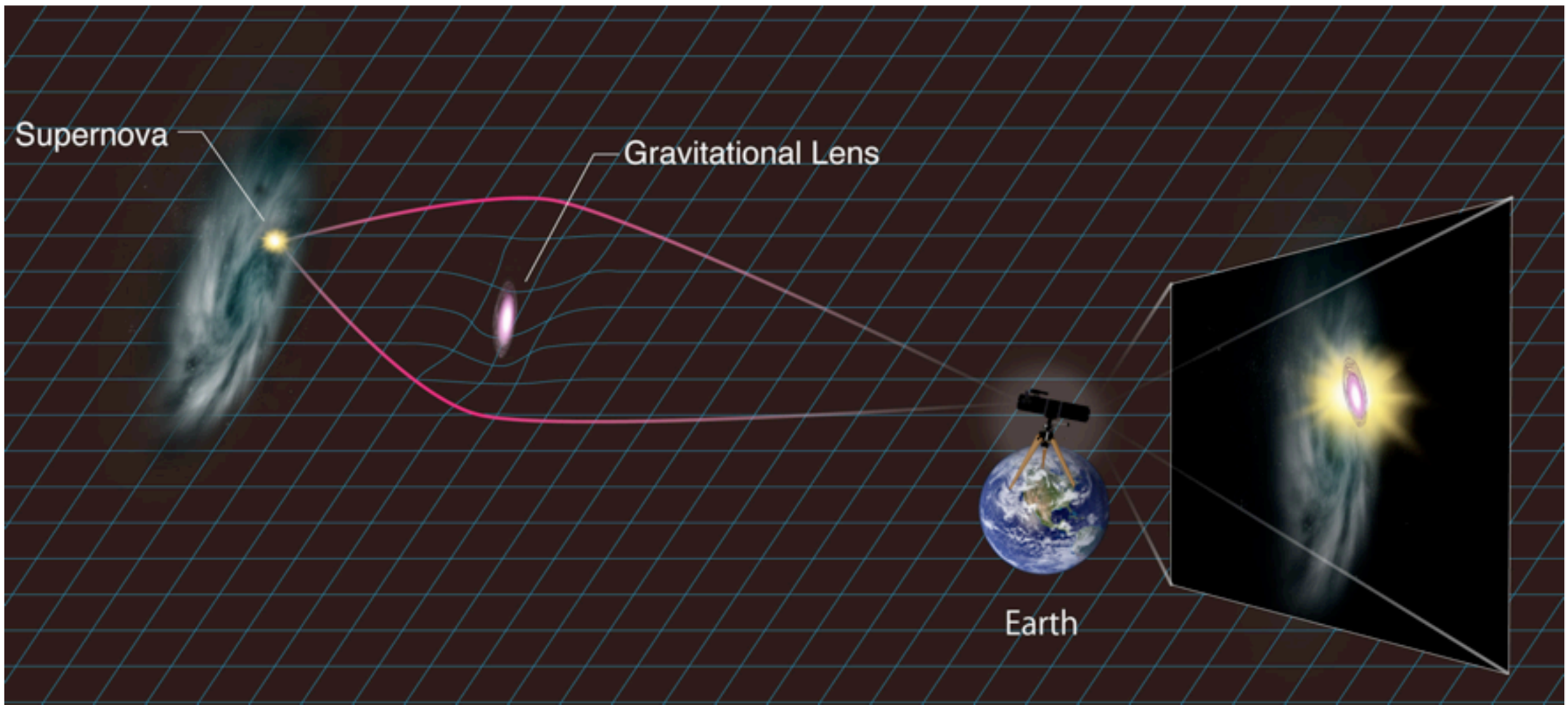
SLSN-I Host Galaxies

- Prefer less luminous hosts that CCSN
- May be similar to LGRB hosts



Lunnan et al. 2014

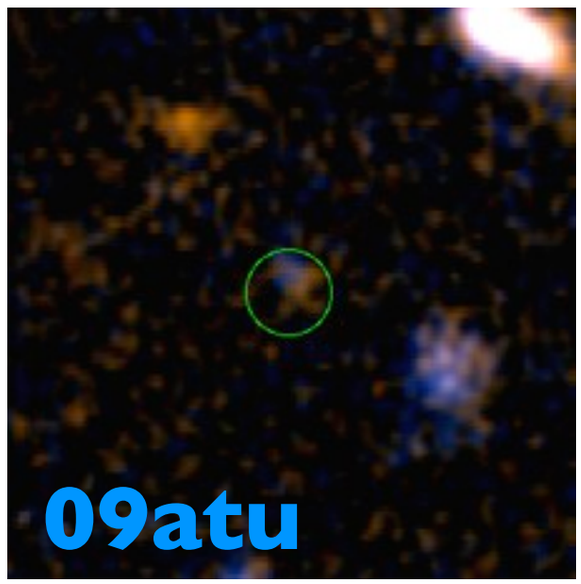
PS1-10afx is not a SLSN; Its a Gravitationally Lensed SNIa



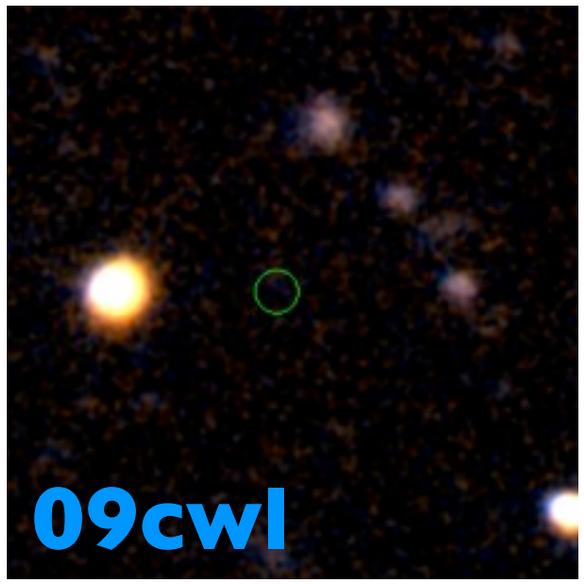
First strongly lensed Type Ia supernova!

SLSN Hosts

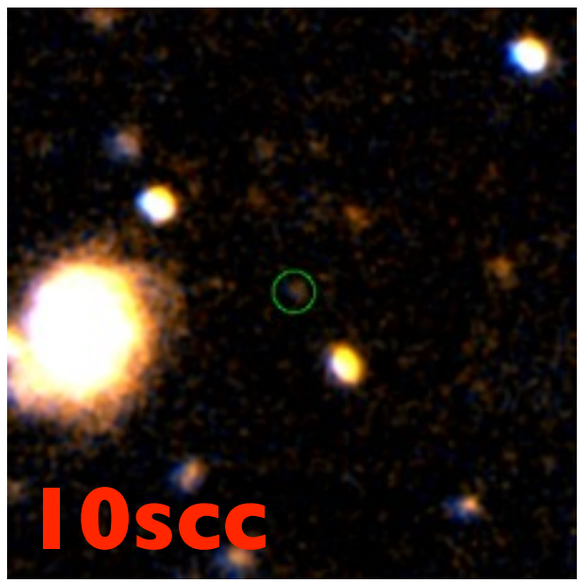
(Perley et al. in prep)



m = 27 mag
M = -15 mag



m = 26 mag
M = -15 mag

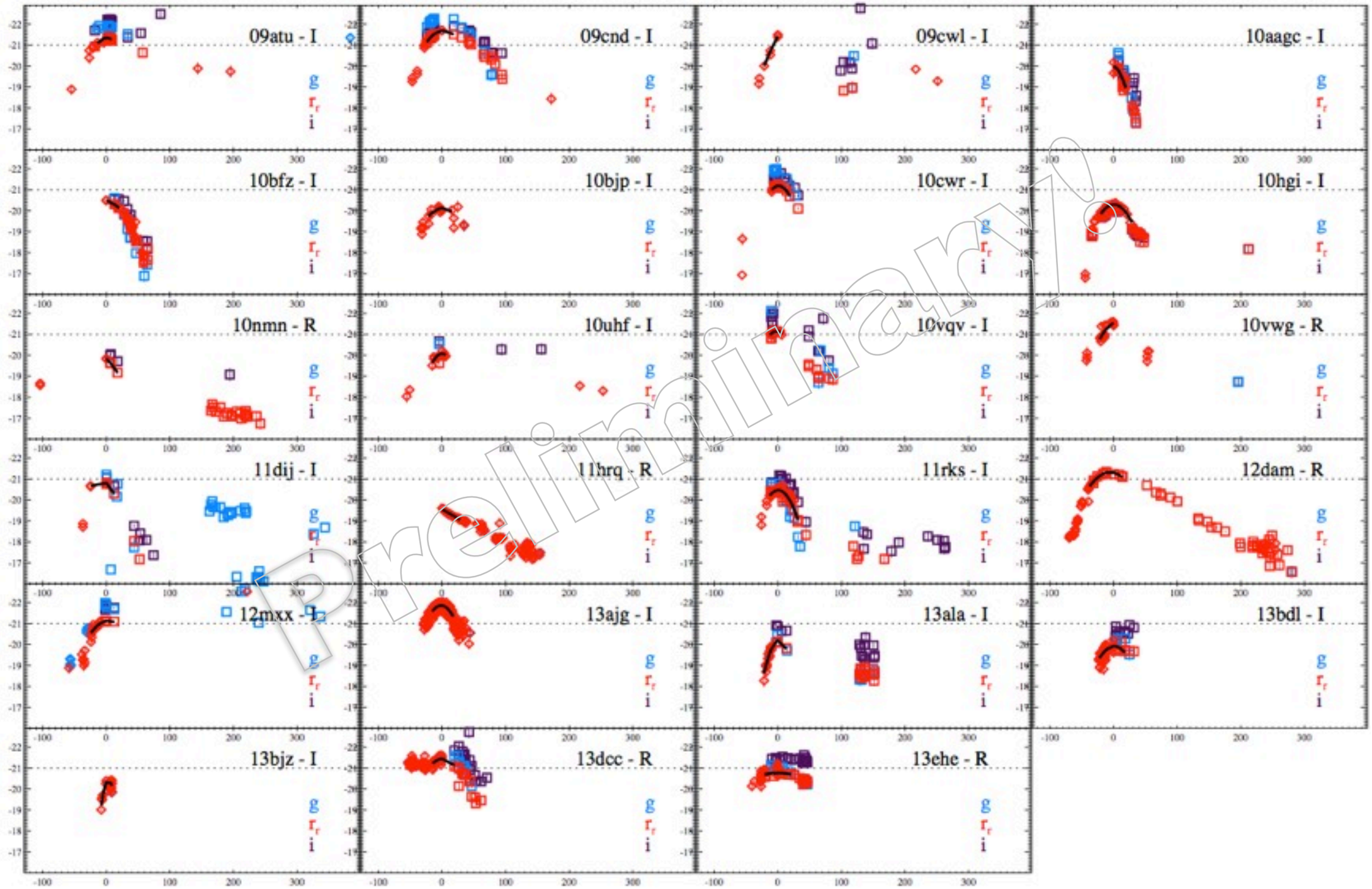


m = 26 mag
M = -14 mag

- SLSN-I hosts fainter than GRB hosts?
- Some have low star formation rates (not starbursts)

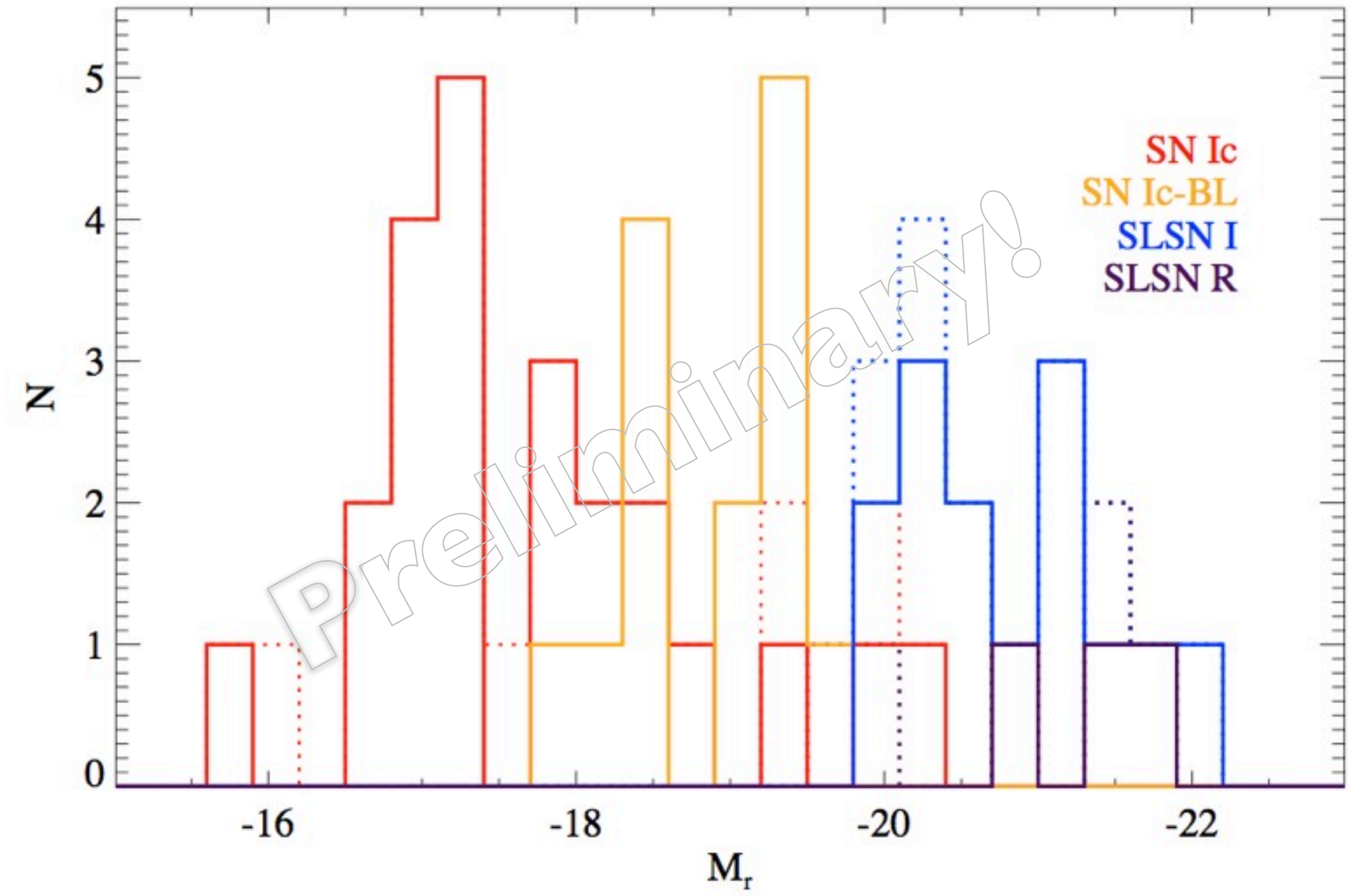
SLSN-I Light Curves

(De Cia et al. in prep)



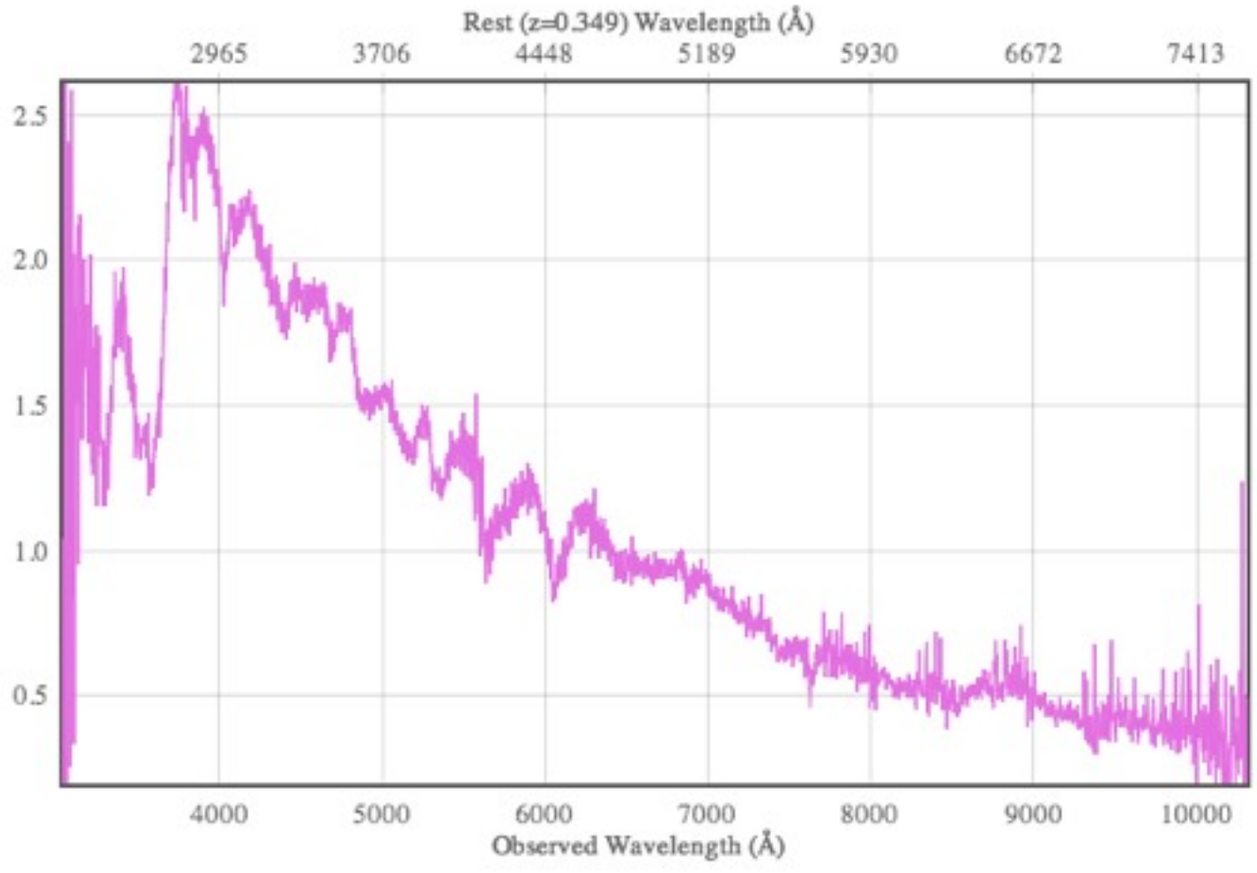
Peak Magnitude Distribution of H-Poor SNe

(De Cia et al. in prep)



SLSN Spectra

(Quimby et al. in prep)

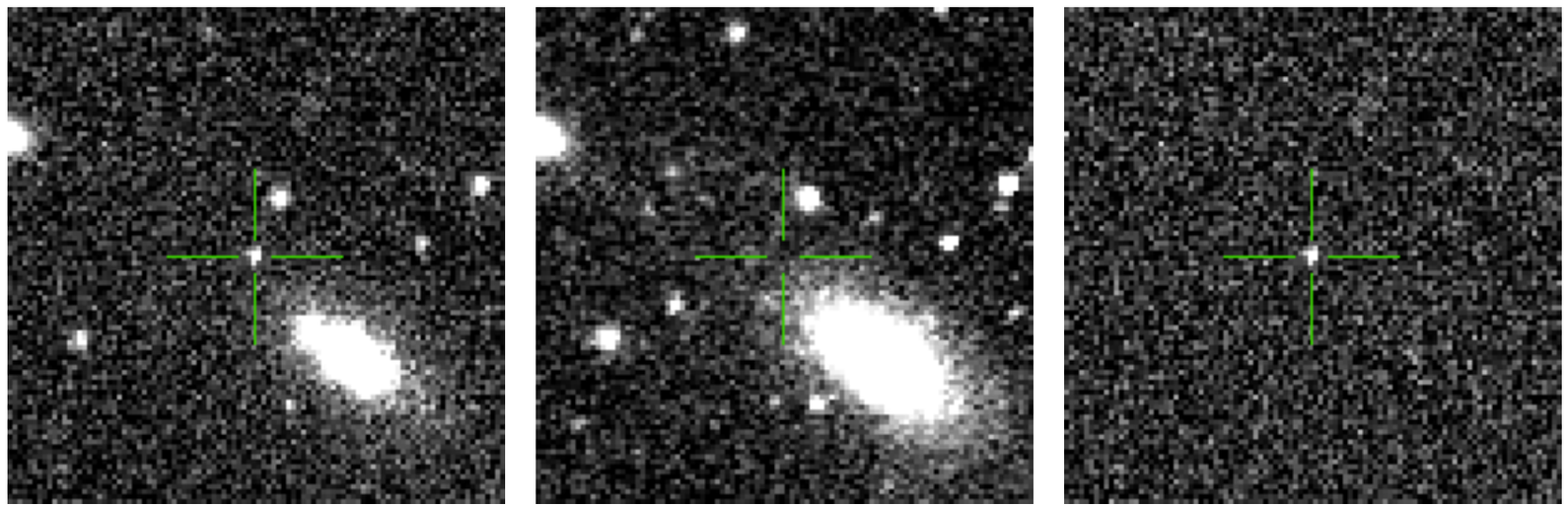


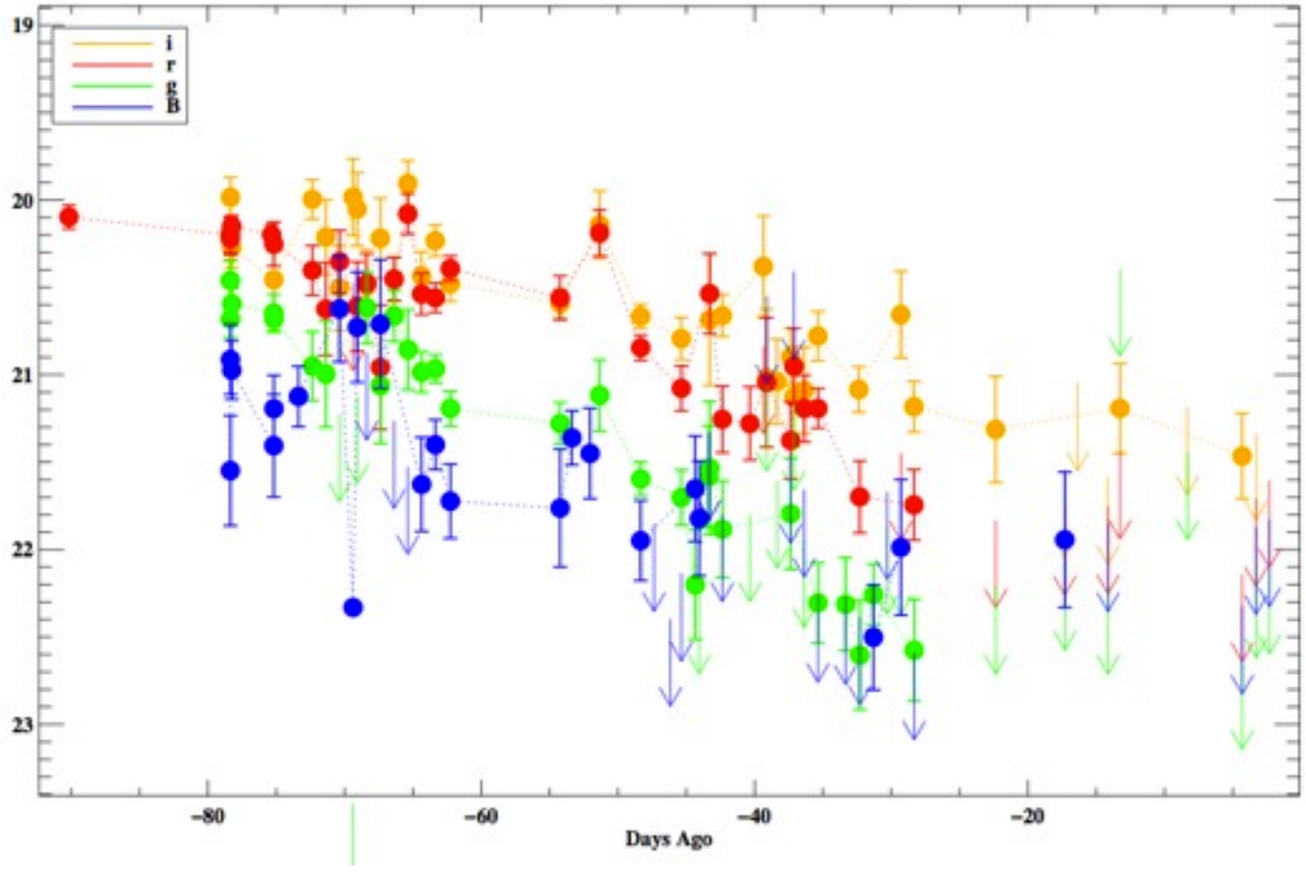
- >230 spectra of PTF SLSN-I and II (excluding iPTF discoveries)

iPTF SLSN

14aon	
14tb	
13ehe	
13djz	
13dcc	13duv
13cjq	13dol
13bjz	13dhz
13bdl	13cco
13ala	12mue
13ajg	12mkp
12gty	12gwu
12mxx	12epg
12dam	12efc
11rks	11hzx
11dij	11dsf
10aagc	10yyc
10vqv	10xee
10uhf	10tpz
10nmn	10scc
10jwd	10qwu
10cwr	10qaf
10bjp	10ooe
09cwl	10heh
09cnd	10fel
09atu	09uy

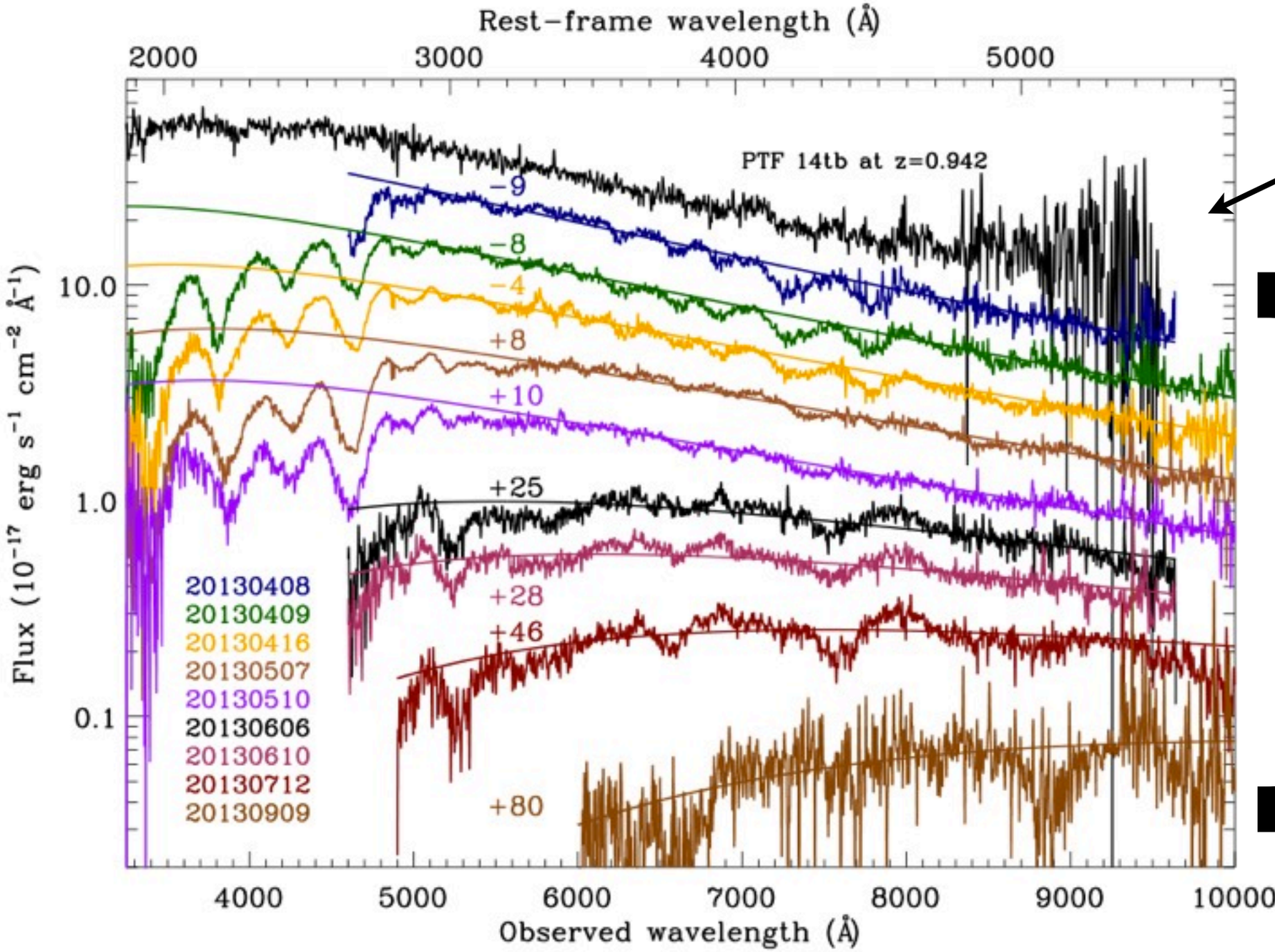
New SLSN-I Champ: iPTF14tb





- z=0.942
- peak mag near -23
- behind galaxy cluster / filament

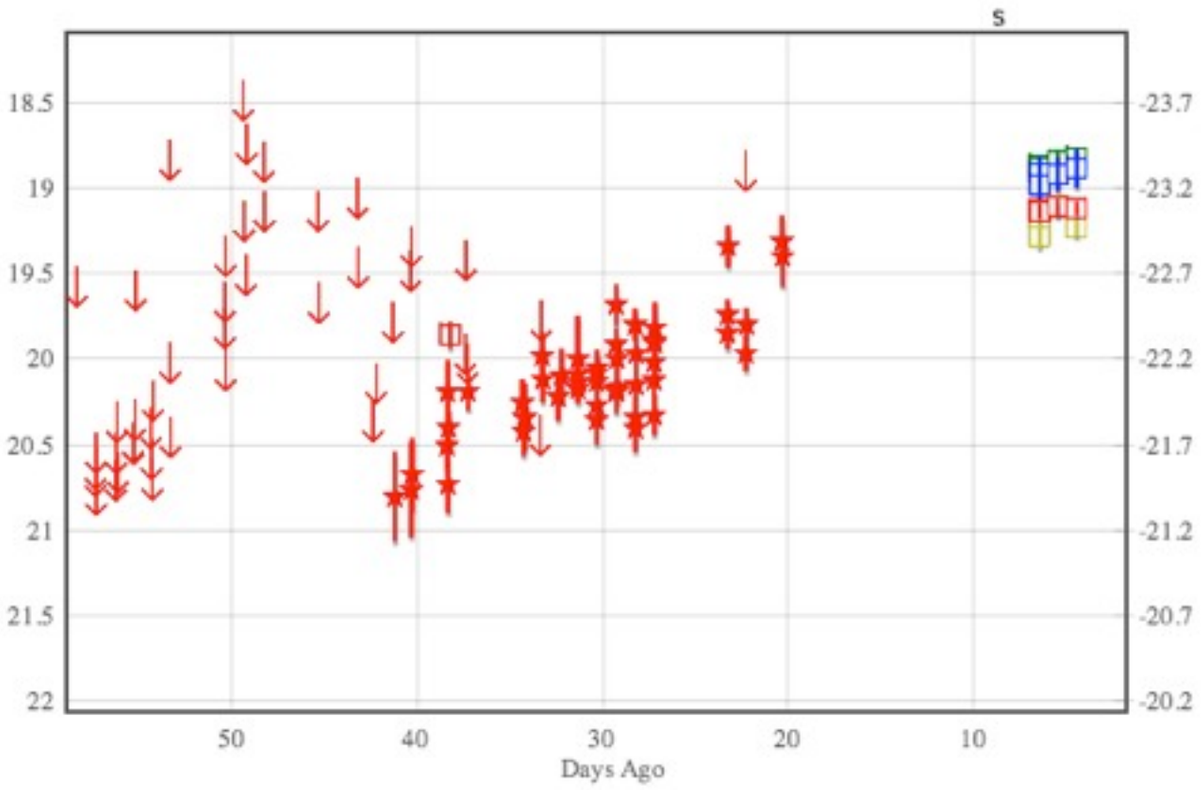
iPTF14tb Spectra

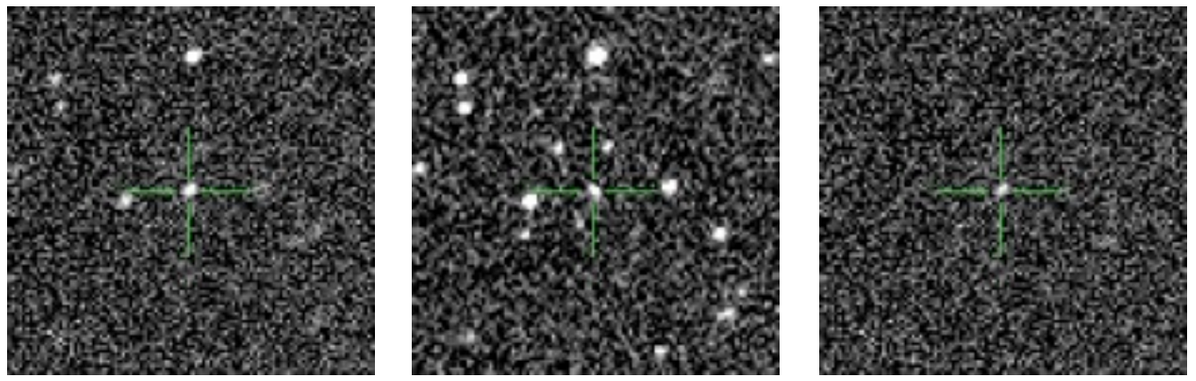


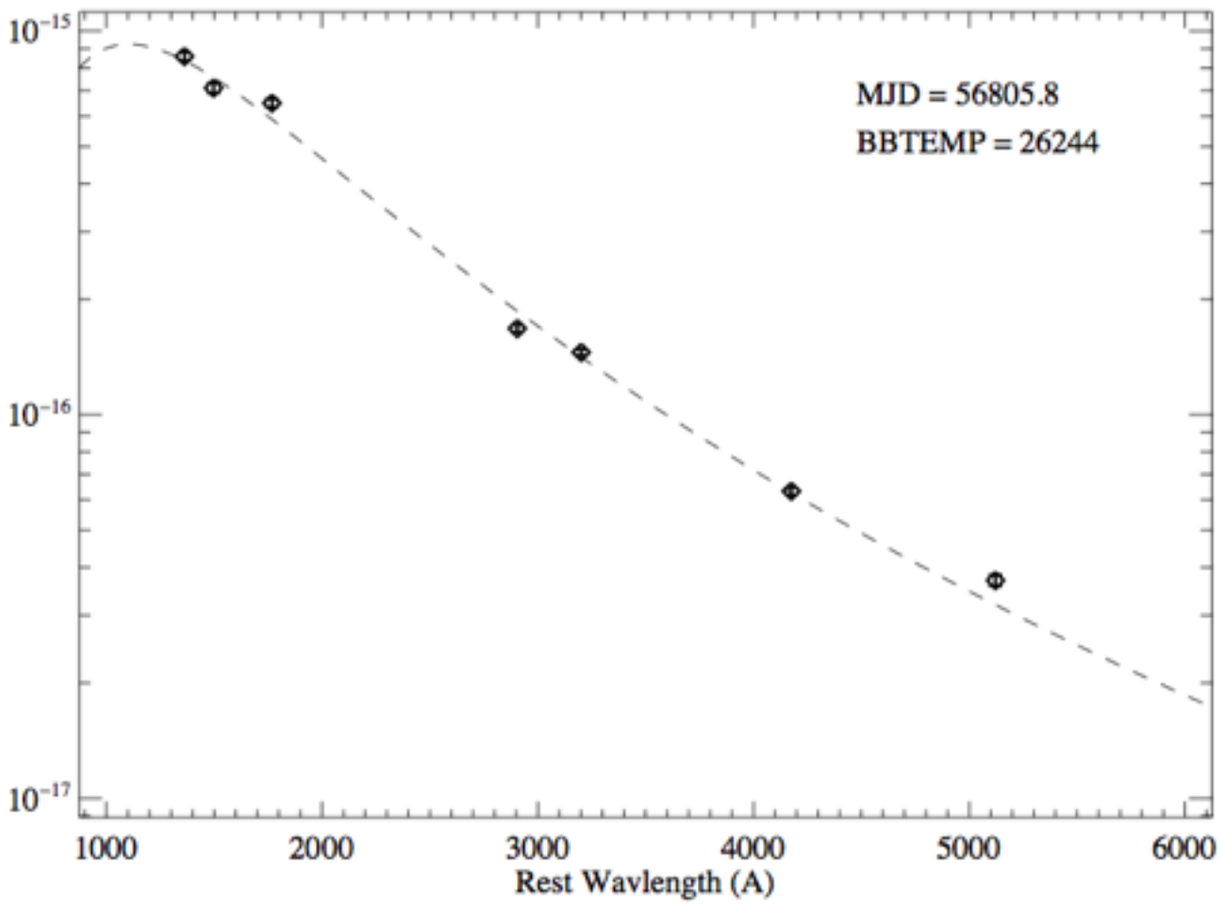
iPTF14tb

iPTF13ajg
Vreeswijk et al.
in prep.

iPTF14aon: SLSN or Something New?







- z=0.49
- peak mag < -22.5
- No broad features yet