GECO Transients

1. What?

   Any transient/variable event involving explosive/accretion phenomena

   Supernovae (SN), gamma-ray bursts (GRBs), tidal disruption events (TDEs), active galactic nuclei (AGN), BH/NS mergers (GWR) etc.

2. When?

   ~30 min meetings

   In theory: every other week; in practice: once per month

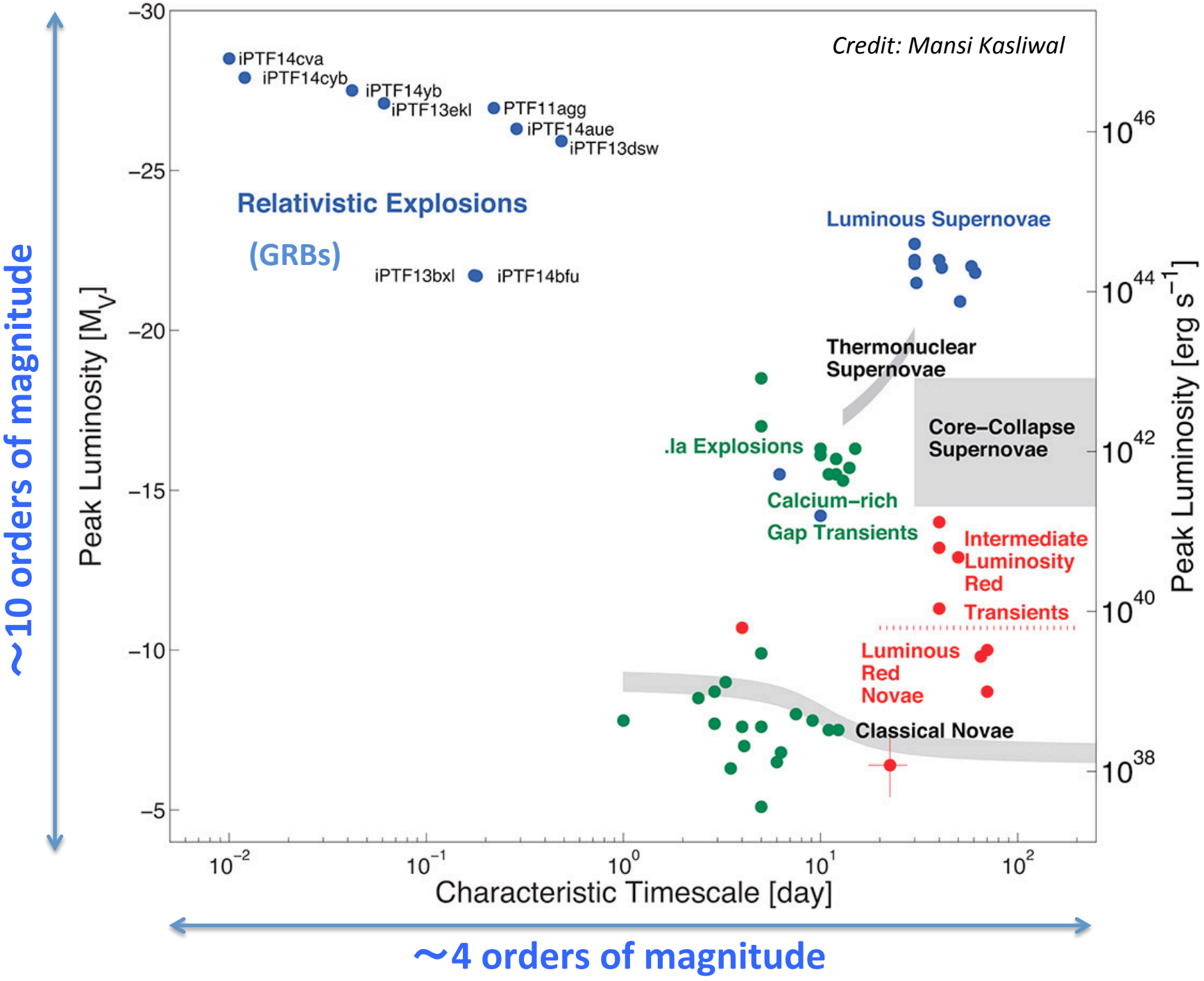
   (4 meetings since February)

3. Who?

   Organizer: Stéphane Blondin

   Mailing list: 13 people; typical attendance 4-5/meeting (sub-critical)

http://wiki.lam.fr/geco/TransientsCircle


Credit: Mansi Kasliwal
iPTF14cva
iPTF14cyb
iPTF14yb
iPTF13ekl
PTF11agg
iPTF14aue
iPTF13dsw
Relativistic Explosions
(GRBs)
iPTF13bxl
iPTF14bfu
Luminous Supernovae
Thermonuclear Supernovae
Core–Collapse Supernovae
.Ia Explosions
Calcium–rich Gap Transients
Intermediate Luminosity Red Transients
Luminous Red Novae
Classical Novae
Peak Luminosity [M_V]
Peak Luminosity [erg s^{-1}]
Characteristic Timescale [day]
~10 orders of magnitude
~4 orders of magnitude

Transients Prospective Meeting (12 May 2016)

Ever-increasing interest in transient science

Numerous events: SN+novae, GRB, TDE, SBO, AGN, NS+BH mergers
Characteristic timescales from (milli-)seconds to months
Radiative display covering sub-mm to γ-rays, + neutrino/GW
➔ progenitors, explosion mechanisms, feedback, first stars

Numerous ongoing and planned surveys

Ongoing: iPTF, PS1, ASSASN, PESSTO…
Future: LSST, Pan-STARRS, SVOM, LT2, WFIRST, (Euclid?)...

National priorities (LAM involvement)

SVOM *(+ground follow-up)****, SOXS***(?), ***NOT+NTE***(?),
LOFAR (NenuFAR), Adv. VIRGO, ***ATHENA, WFIRST***
suivi sol Gaia (***WEAVE***, MOONS, ***MISTRAL,*** 4MOST), LSST **(?)**

Dong et al. (Science, 351, 257)

ASTRONOMY

ASASSN-15lh: A highly super-luminous supernova

Subo Dong,[1*] B. J. Shappee,[2] J. L. Prieto,[3,4] S. W. Jha,[5] K. Z. Stanek,[6,7] T. W.-S. Holoien,[6,7] C. S. Kochanek,[6,7] T. A. Thompson,[6,7] N. Morrell,[8] I. B. Thompson,[2] U. Basu,[6] J. F. Beacom,[6,7,9] D. Bersier,[10] J. Brimacombe,[11] J. S. Brown,[6] F. Bufano,[12] Ping Chen,[13] E. Conseil,[14] A. B. Danilet,[6] E. Falco,[15] D. Grupe,[16] S. Kiyota,[17] G. Masi,[18] B. Nicholls,[19] F. Olivares E.,[4,20] G. Pignata,[4,20] G. Pojmanski,[21] G. V. Simonian,[6] D. M. Szczygiel,[21] P. R. Woźniak[22]

We report the discovery of ASASSN-15lh (SN 2015L), which we interpret as the most luminous supernova yet found. At redshift z = 0.2326, ASASSN-15lh reached an absolute magnitude of $M_{u,\mathrm{AB}} = -23.5 \pm 0.1$ and bolometric luminosity $L_{\mathrm{bol}} = (2.2 \pm 0.2) \times 10^{45}$ ergs s^{-1}, which is more than twice as luminous as any previously known supernova. It has several major features characteristic of the hydrogen-poor super-luminous supernovae (SLSNe-I), whose energy sources and progenitors are currently poorly understood. In contrast to most previously known SLSNe-I that reside in star-forming dwarf galaxies, ASASSN-15lh appears to be hosted by a luminous galaxy ($M_K \approx -25.5$) with little star formation. In the 4 months since first detection, ASASSN-15lh radiated $(1.1 \pm 0.2) \times 10^{52}$ ergs, challenging the magnetar model for its engine.

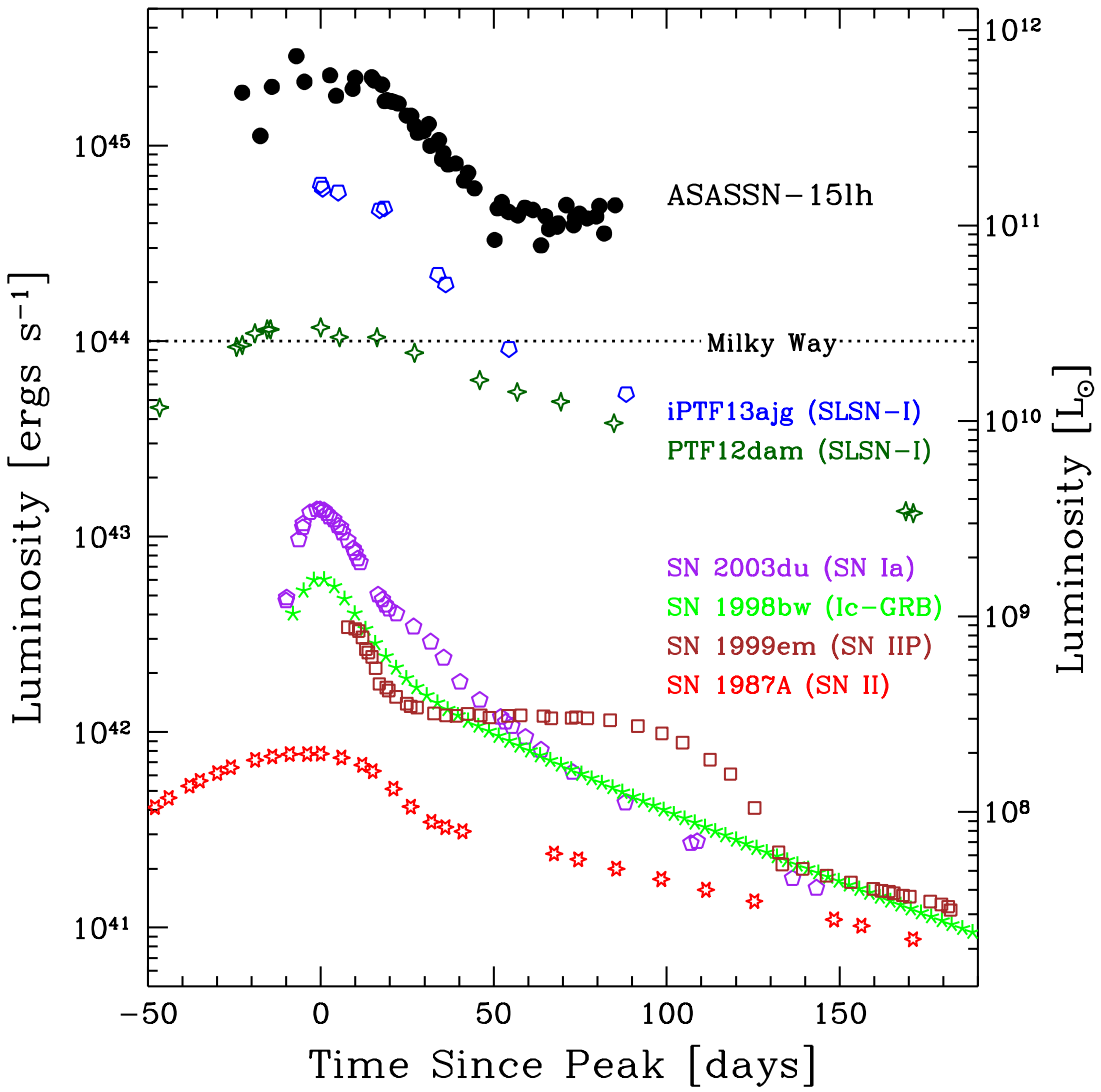


Figure S5. Bolometric light curves of ASASSN-15lh and other supernovae for comparison.

Possible power sources:

1) CSM shock interation?

2) ^{56}Ni radioactive decay?

3) Magnetar spindown?

4) Tidal-disruption event?

Thanks for your (transient) attention!