

Palomar Transient Factory



Palomar Transient Factory (PTF)

- PTF is dedicated project to identify variable objects and transients
- Palomar 48-inch Schmidt telescope equipped with 7.8 square degrees detector
- Uniqueness: high cadence
 - Obtained by single band discovery
 - Followed by multi-band photometry with P60, MDM, Pairitel, Wise (Israel) and potentially India and Japan

All for one



Science Goals

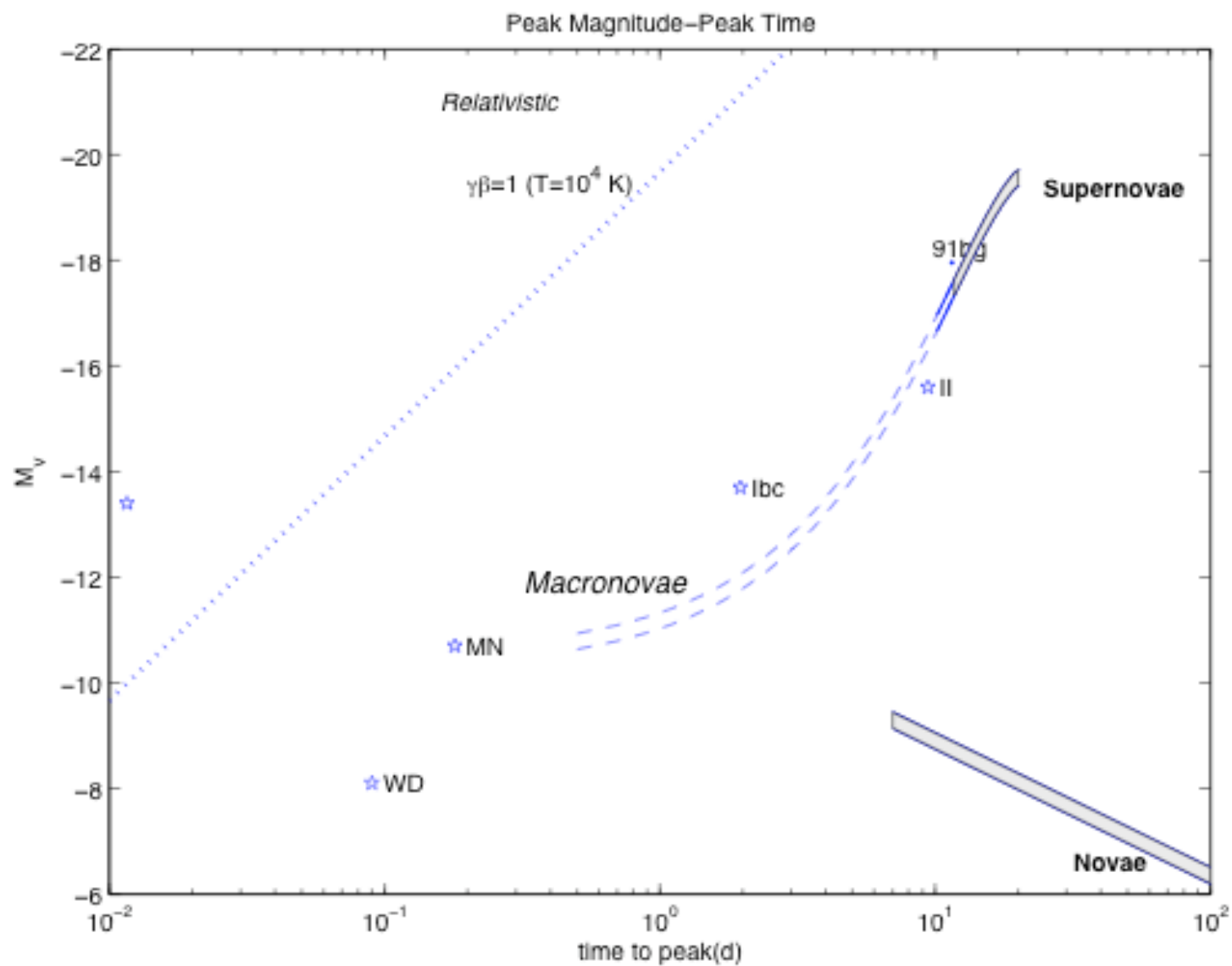
- Supernovae: core collapse
 - Anonymous (lower metallicity) host galaxies
 - Systematic study of Ib and Ic supernovae
 - Catch supernova at very early times
- Supernovae: Ia
 - Cosmology hooley (luminosity function at $z=0$)
 - Catch supernovae at very early times

Science Goals

- Transients in nearby galaxies
 - novae
 - Luminous red novae
 - LBV outbursts (In supernovae)
- Nuclear Black Holes:
 - blazars,
 - burping
 - tidal events

Science Goals

- Galactic Transients:
 - AM CVn
 - Hibernating CVs (and dwarf novae)
 - Flare stars
 - Pre-main sequence stars
 - Planetary Transits

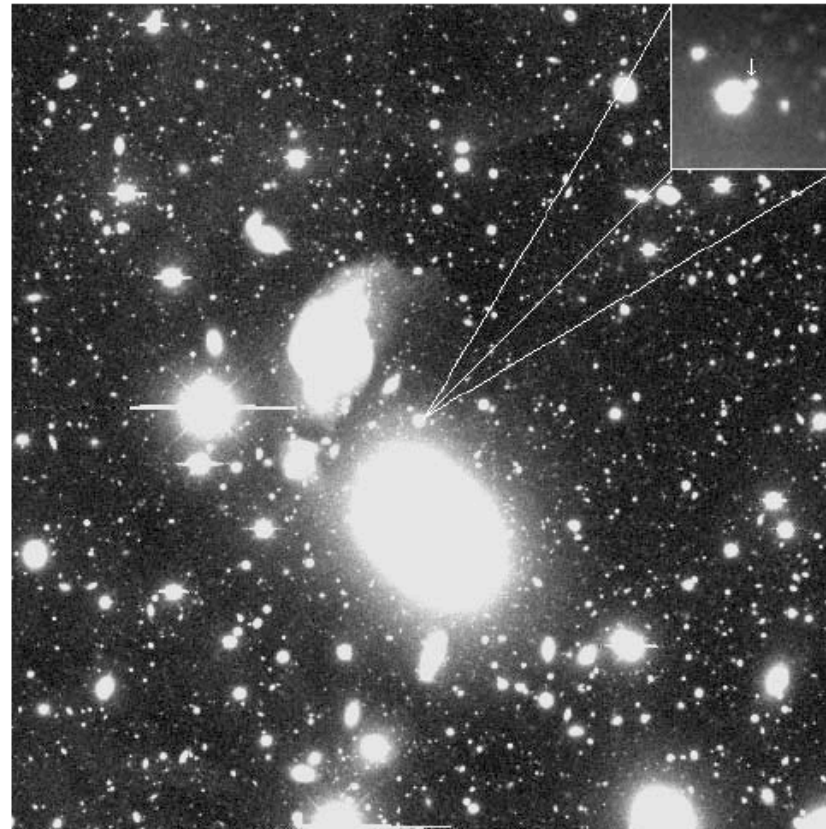


Finding Interesting Fast Transients ain't easy

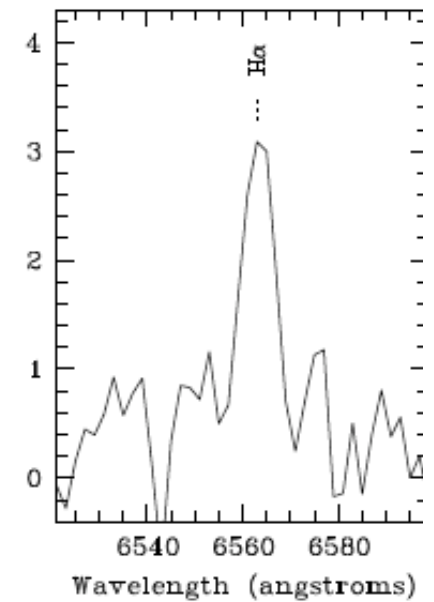
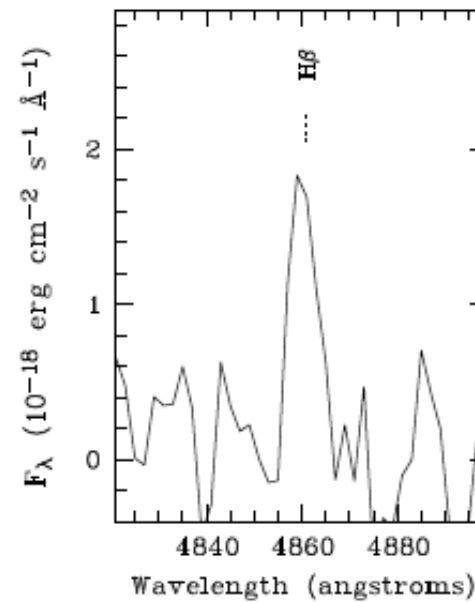
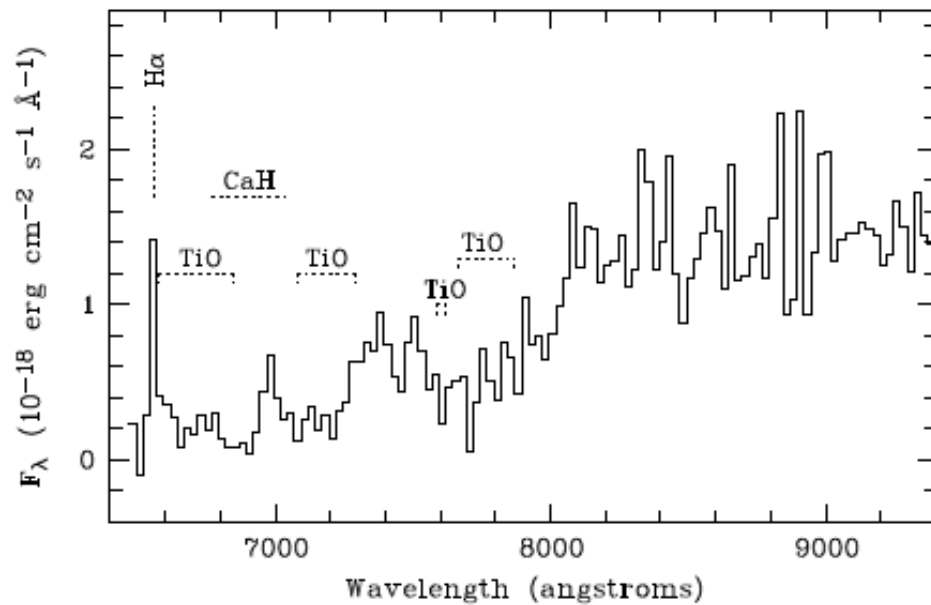
THE DEEP LENS SURVEY TRANSIENT SEARCH. I. SHORT TIMESCALE AND ASTROMETRIC VARIABILITY

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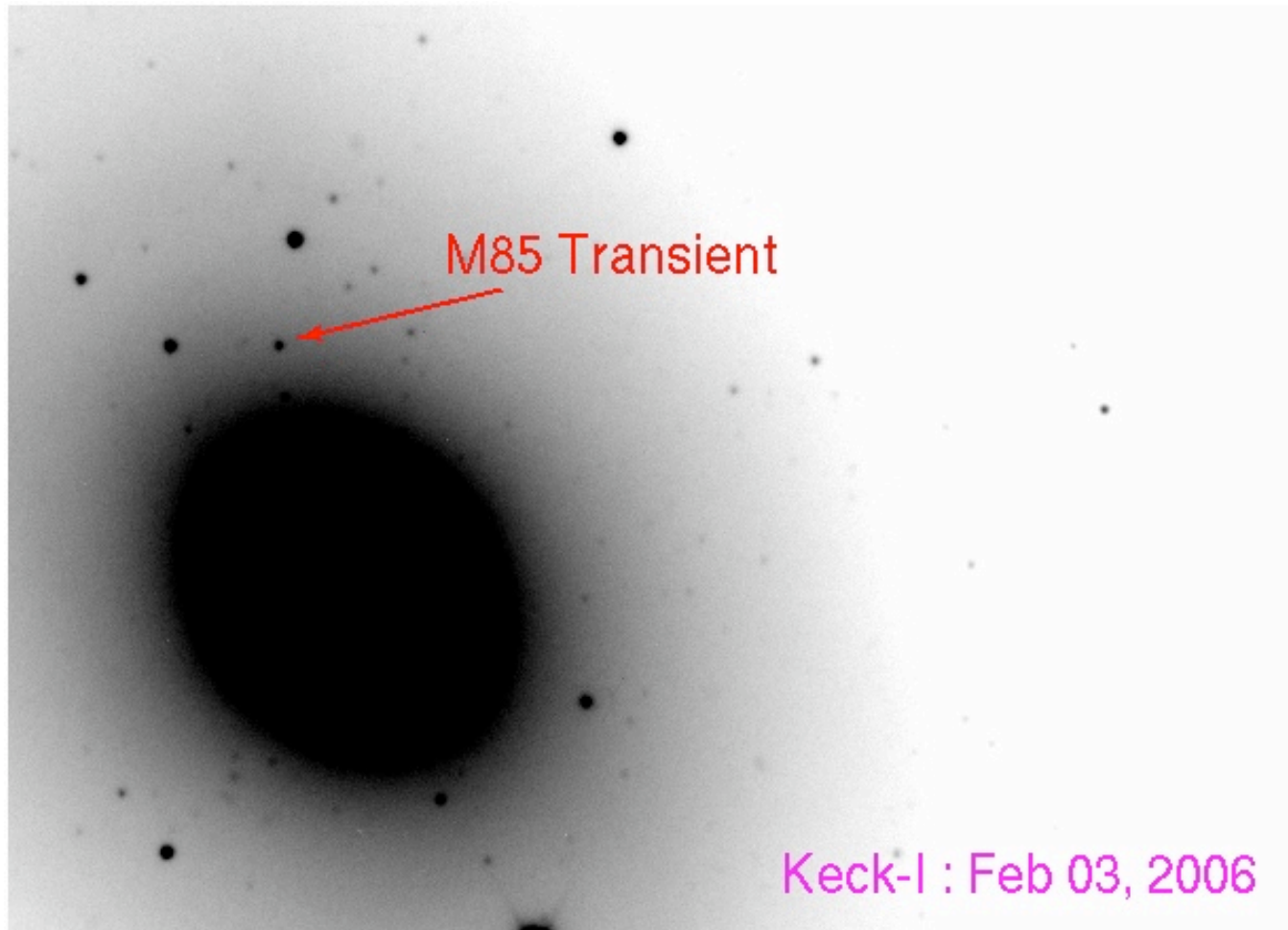


A Foreground Fog of Flares



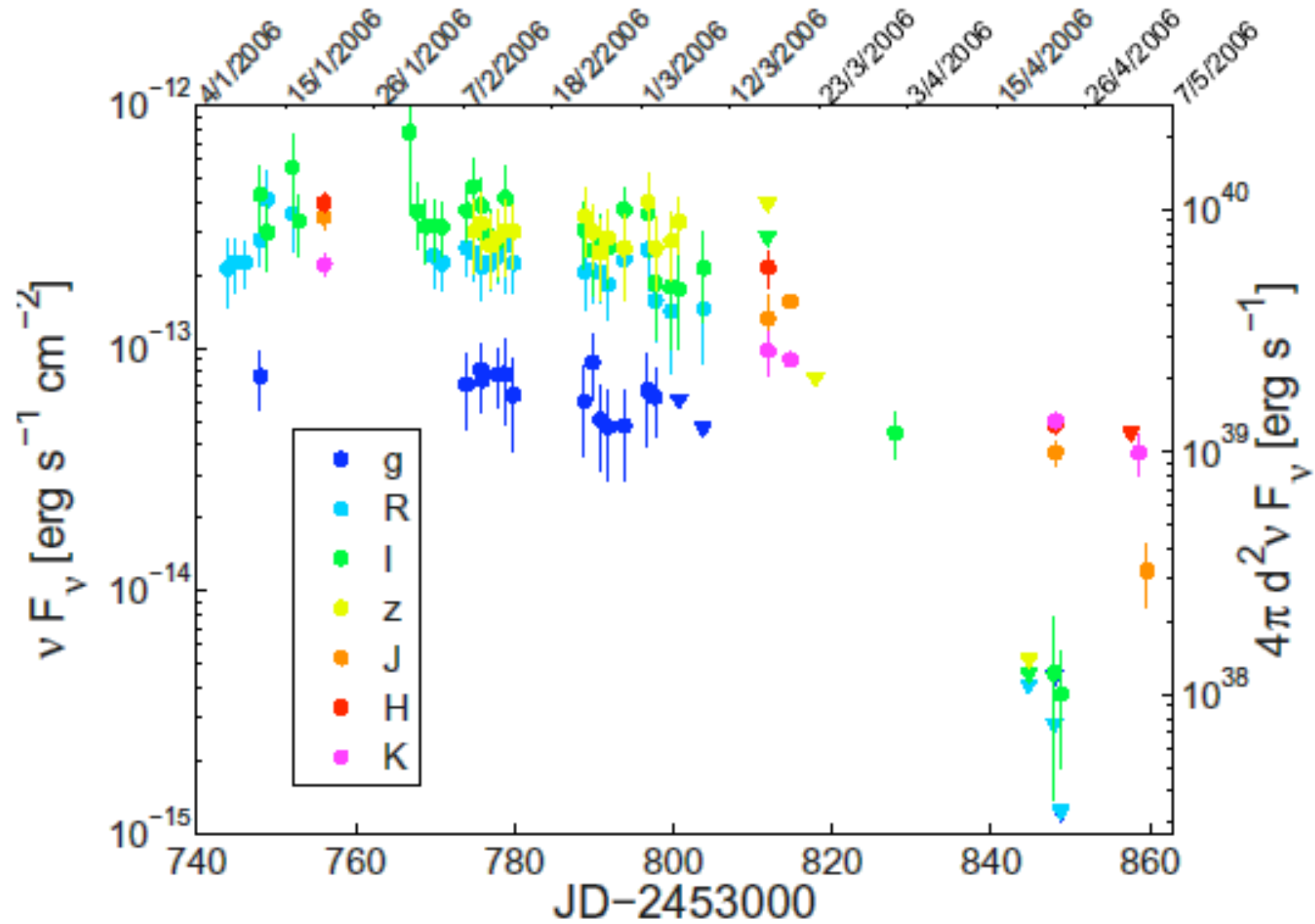
Fog overwhelms any astrophysical signal by 1000

Long Events: A Start (Stellar Mergers)

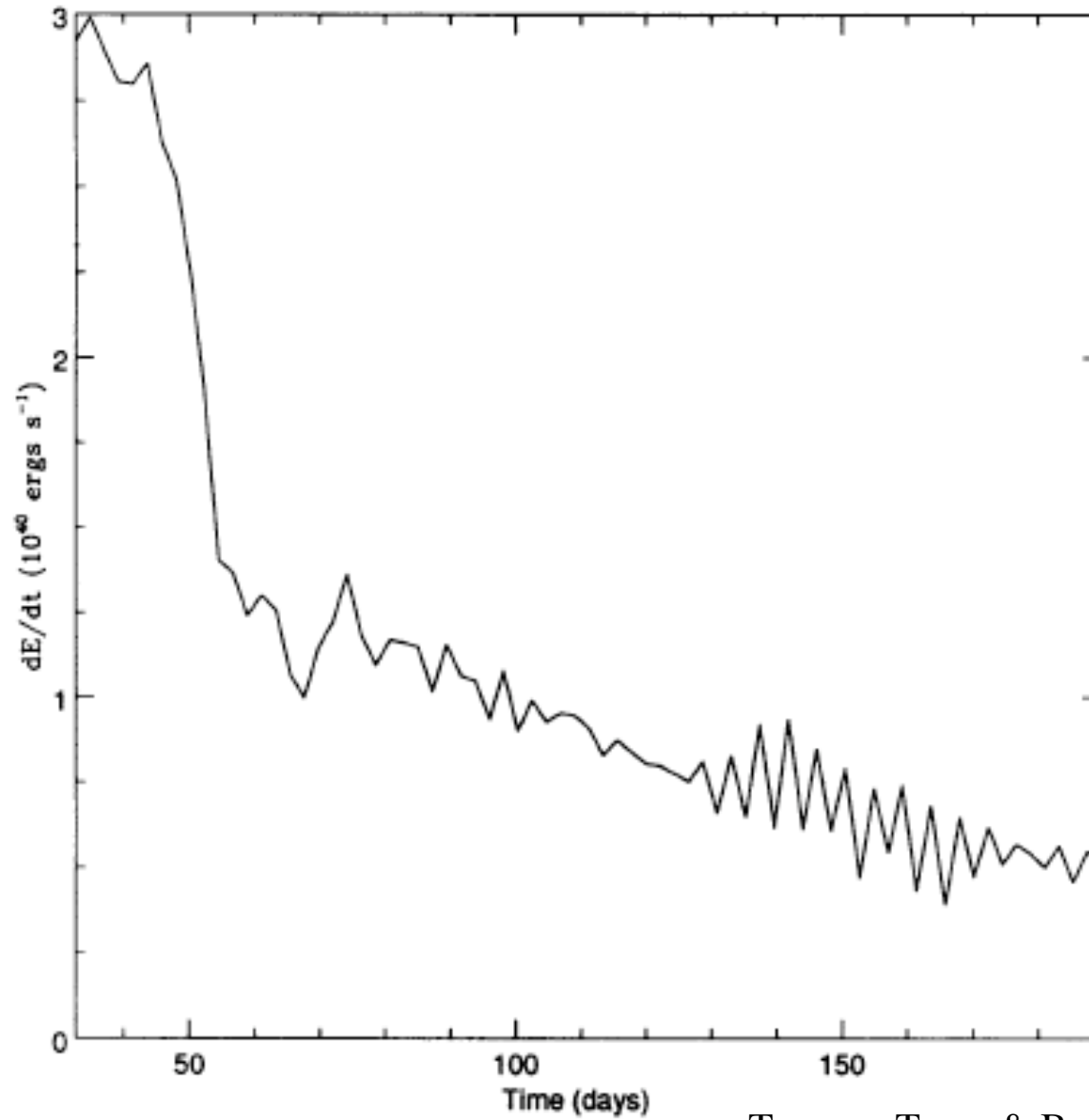


Kulkarni et al 2007

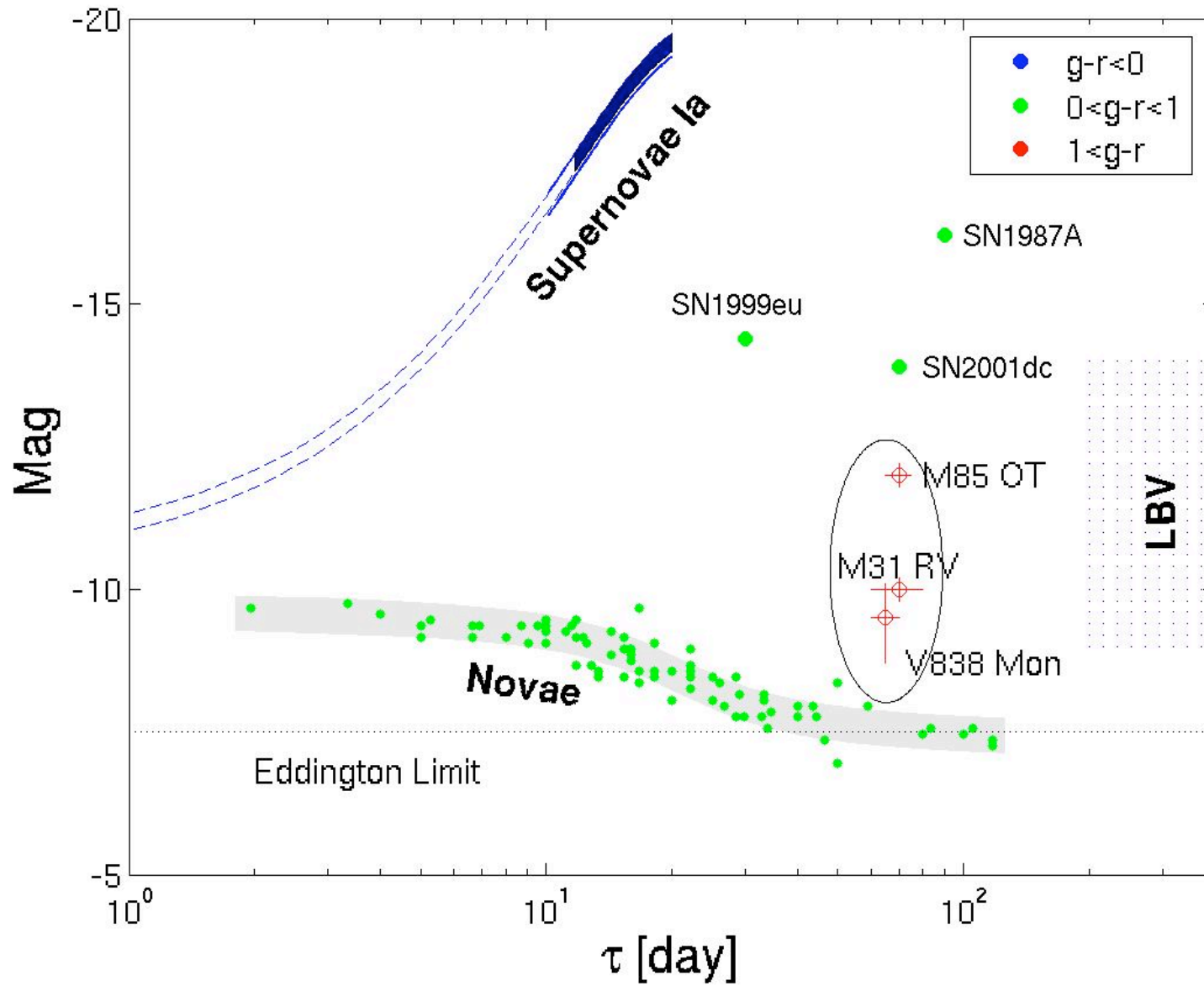
Hyper-Eddington Red Nova



SPH simulations of common envelope



Terman, Taam & Bodenheimer 1994



PTF: Partnership

- Weizmann Institute (Israel)
- Las Cumbres Observatory, Santa Barbara
- Columbia University
- Lawrence Berkeley Lab/Yale
- IPAC
- Associates: CFH, PSU

Triple cadence surveys

- 1-day cadence
 - AM CVn
 - Peculiar events in nearby galaxies
- 3-day cadence
 - AGN burping & bleating
- 9-day cadence
 - Supernovae

Expect action by September 2008