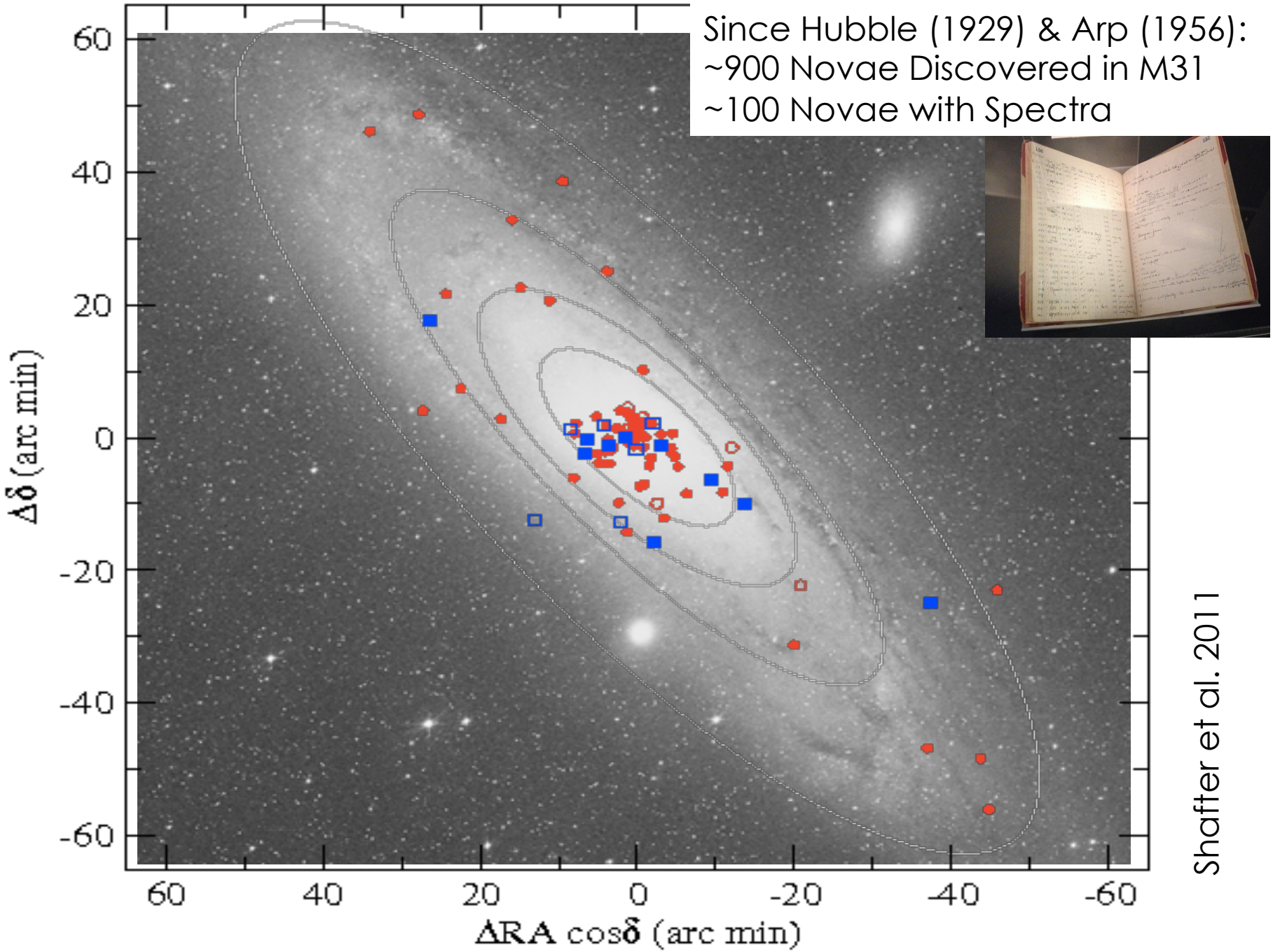
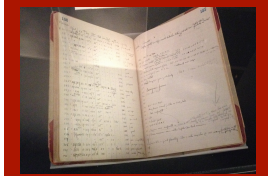
Classical Novae in Andromeda

Mansi M. Kasliwal
Hubble Fellow & Carnegie-Princeton Fellow
Princeton University & Carnegie Institution for Science



Shafter et al. 2011



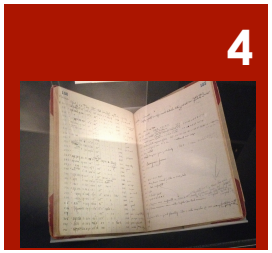
About Novae

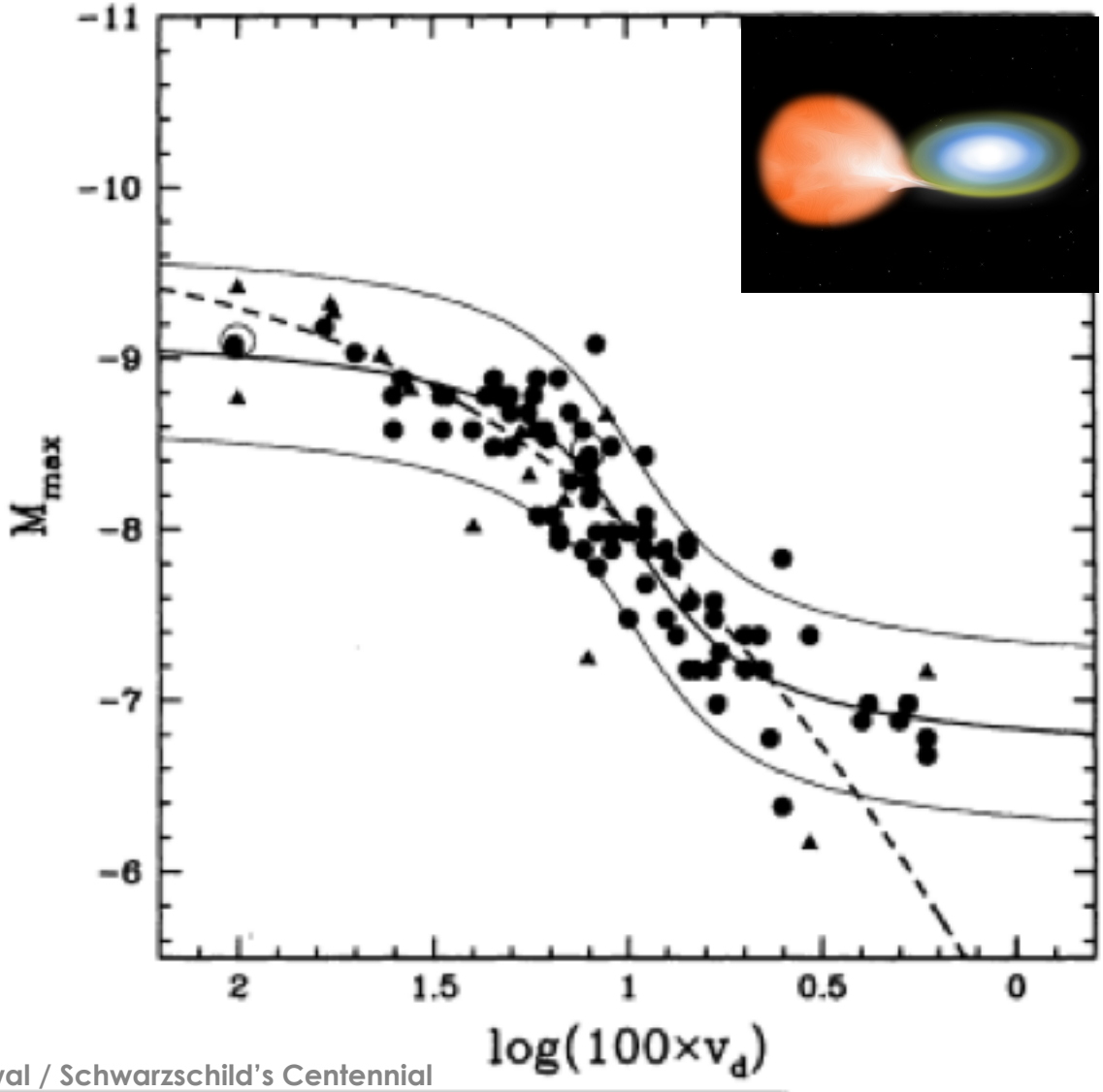
- Peak Luminosity: -6 to -10 mag
- Evolution Timescale: 1 to 100 days
- Recurrence: 10 to 100,000 years
- Rate: ~40 per year in M31
- Two spectroscopic classes: Fe class & He/N class
- MMRD relation explained by the mass of the white dwarf

Why study novae?

- Stellar Physics
- Cosmology !?
- Progenitors of SN Ia? *See Poster By Marina Orio*

MMRD Relation: M31

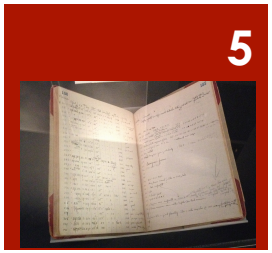


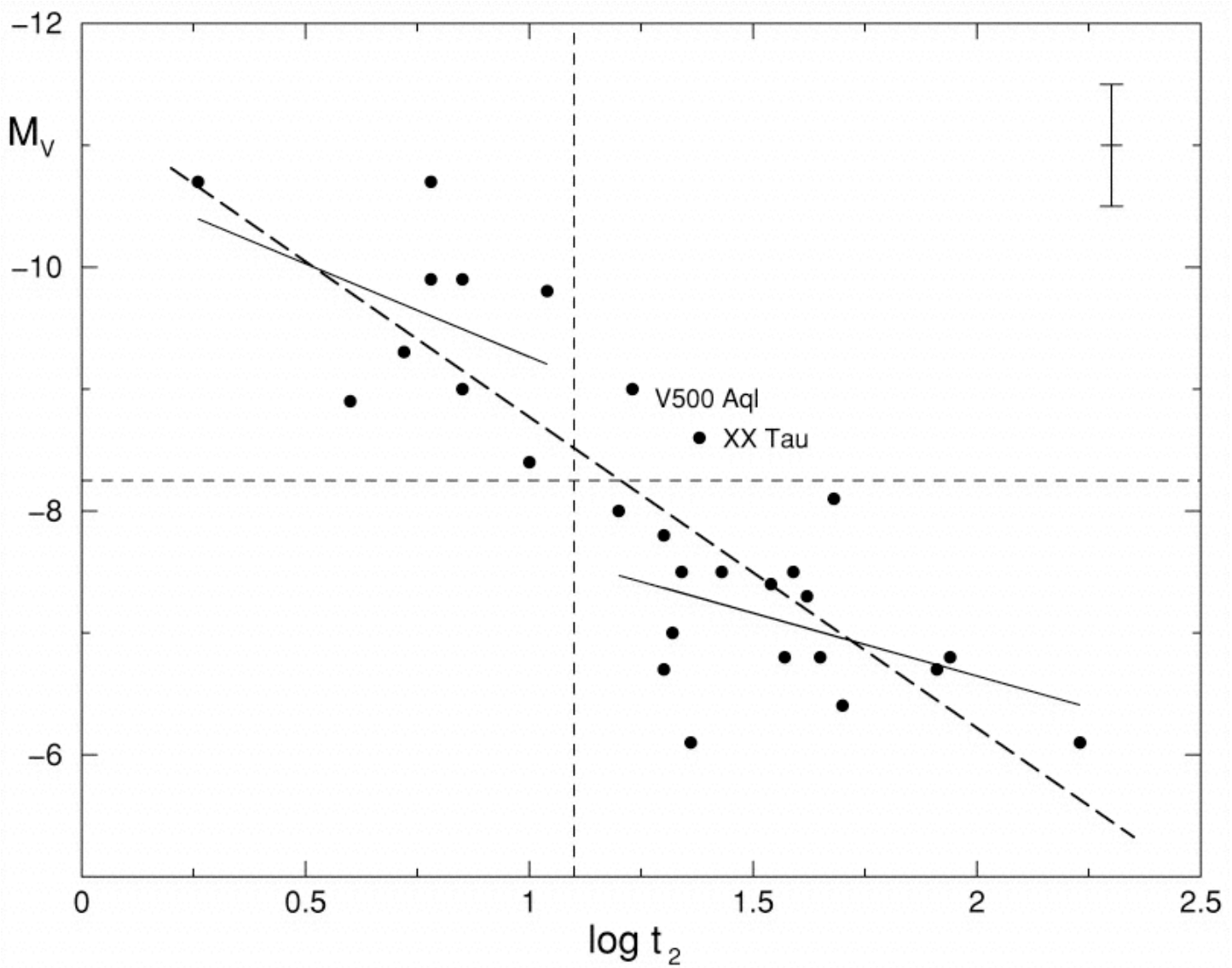


$$M_V = -7.92 - 0.81 \arctan \frac{1.32 - \log(t_2)}{0.23}$$

Della Valle and Livio '95

MMRD relation: Milky Way

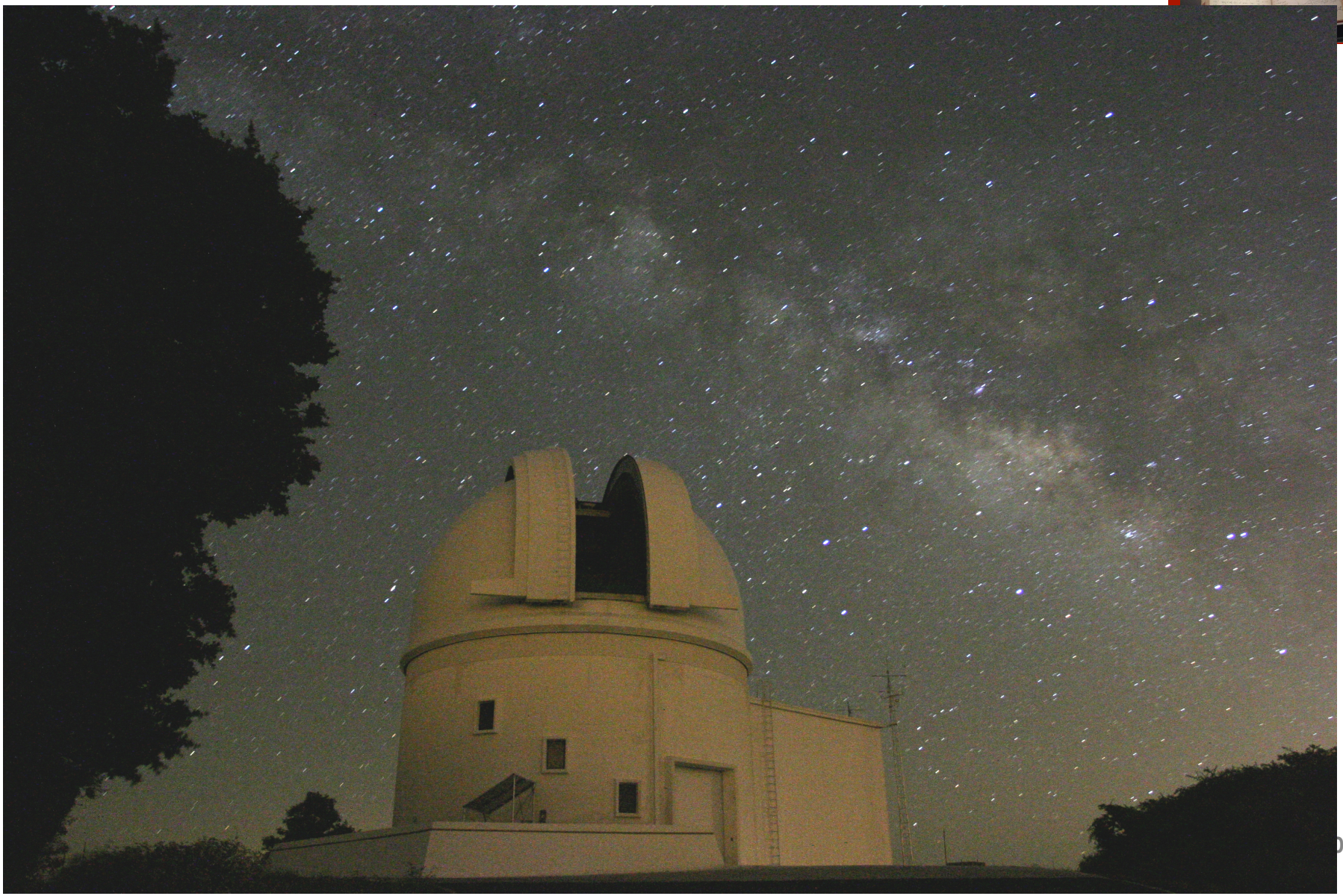


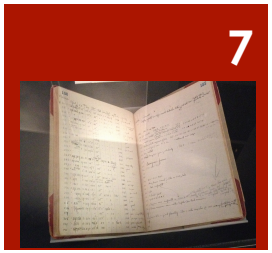


Downes and Duerbeck '00

P60-FasTING:

Palomar 60-inch Fast Transients in Nearest Galaxies



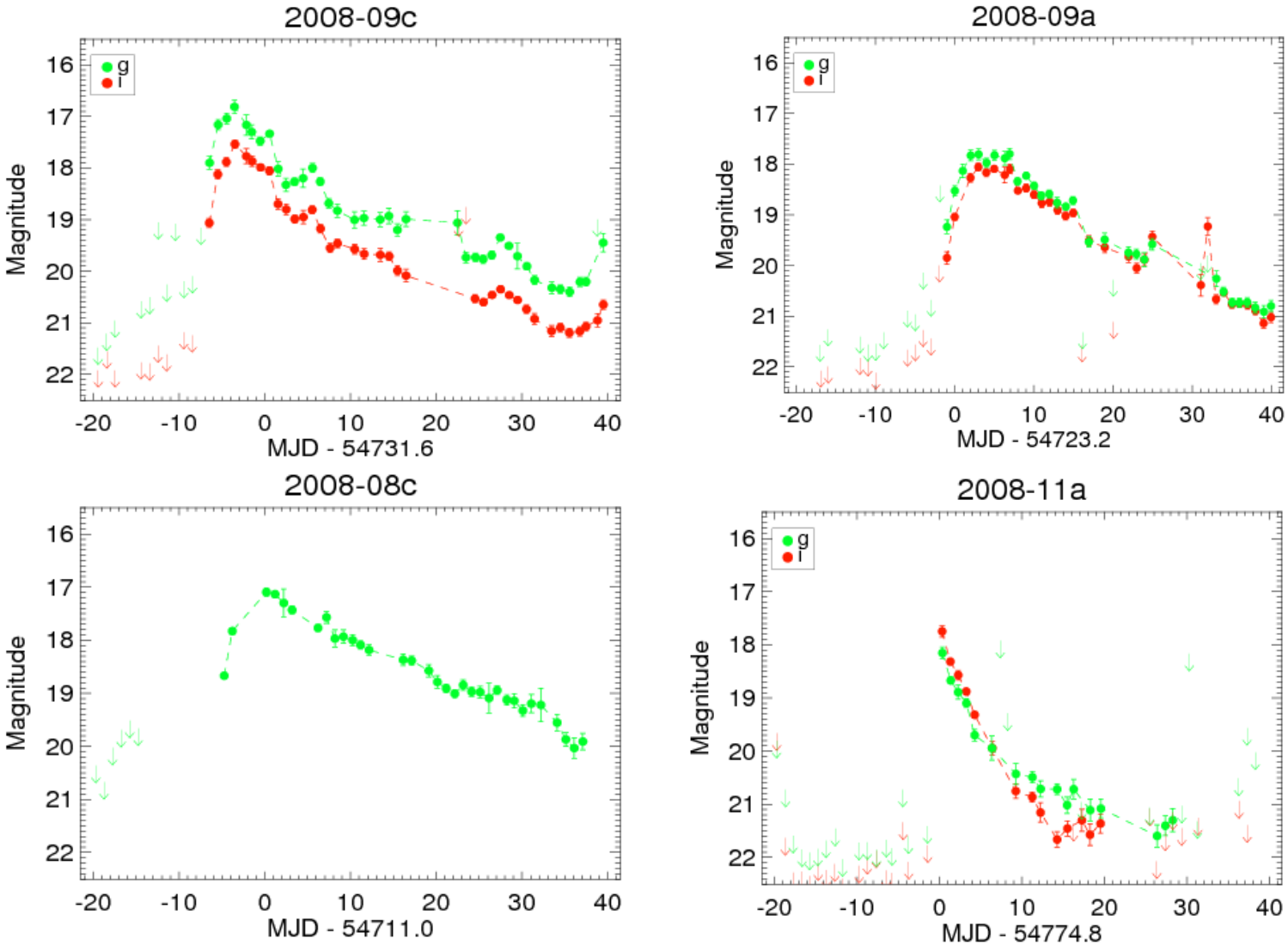


Palomar Transient Factory

A wide-angle, high cadence survey dedicated to systematically chart the transient sky.

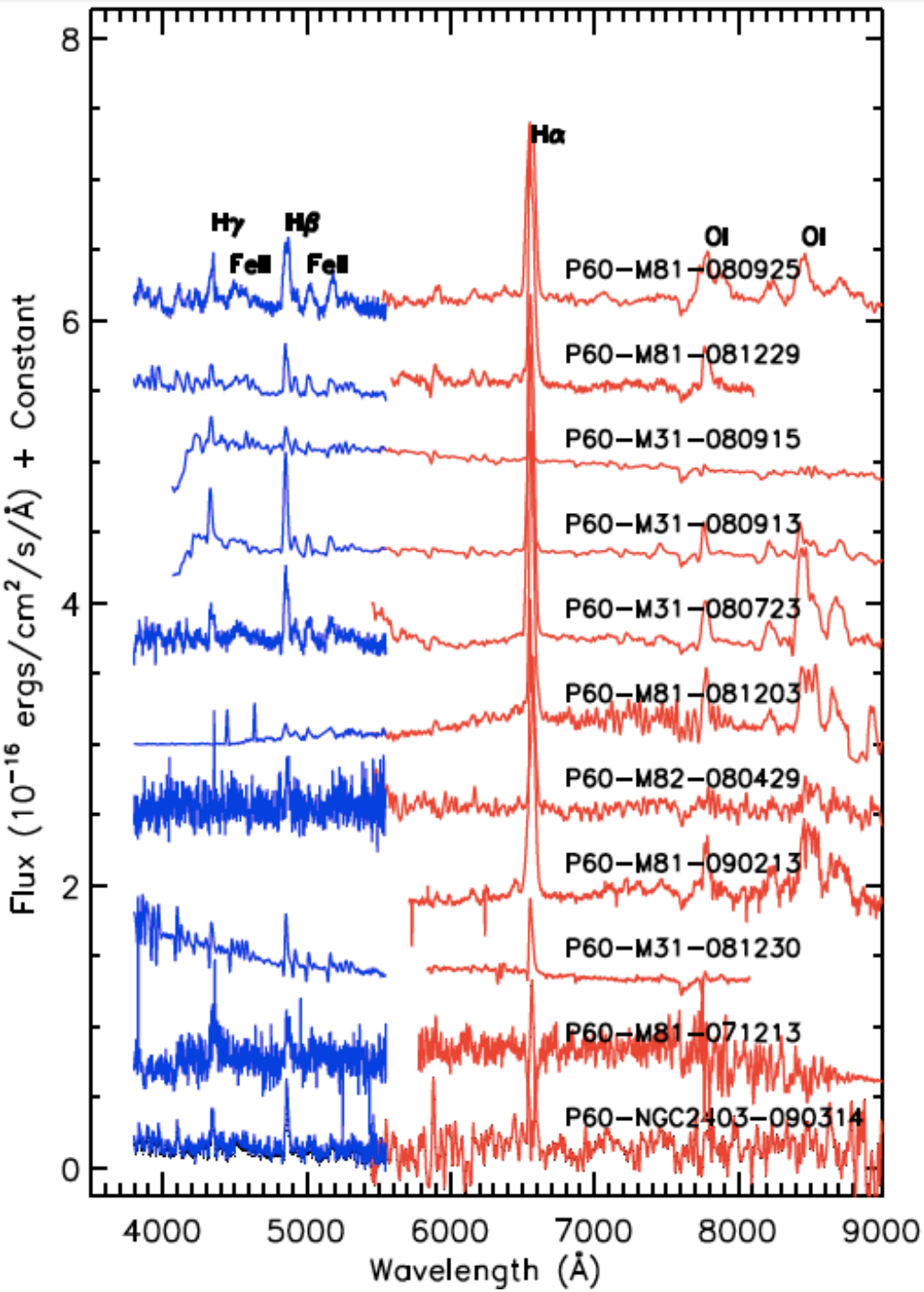
Discovery Machine + Classification Engine

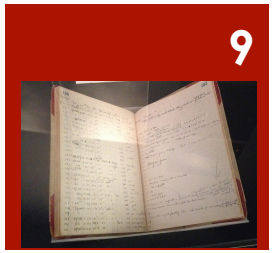
Faint and Fast Novae



Kasliwal et al. 2010a

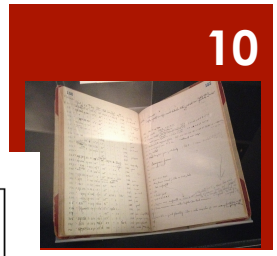
P60-FasTING Spectra

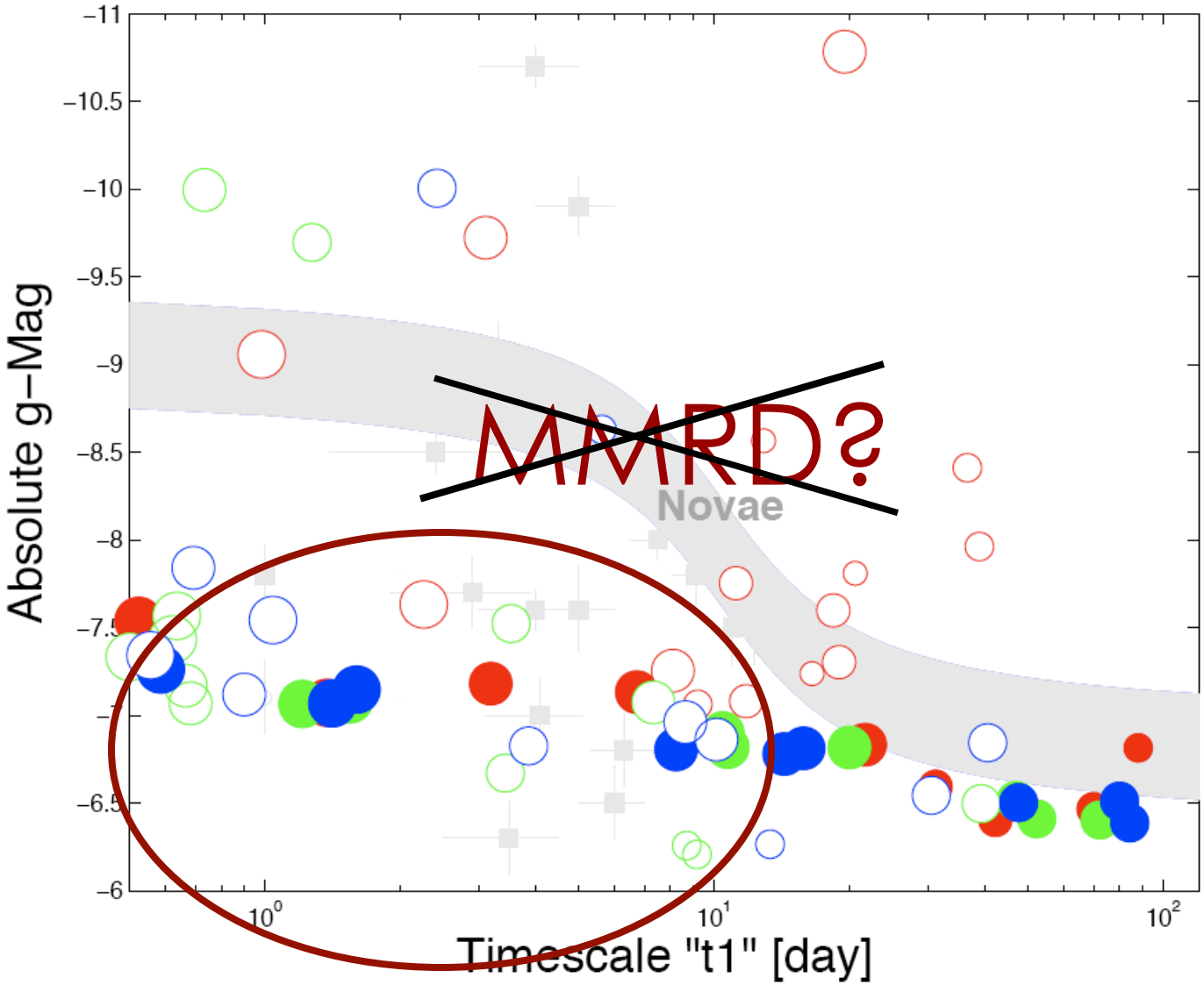




Kasliwal et al. 2010a

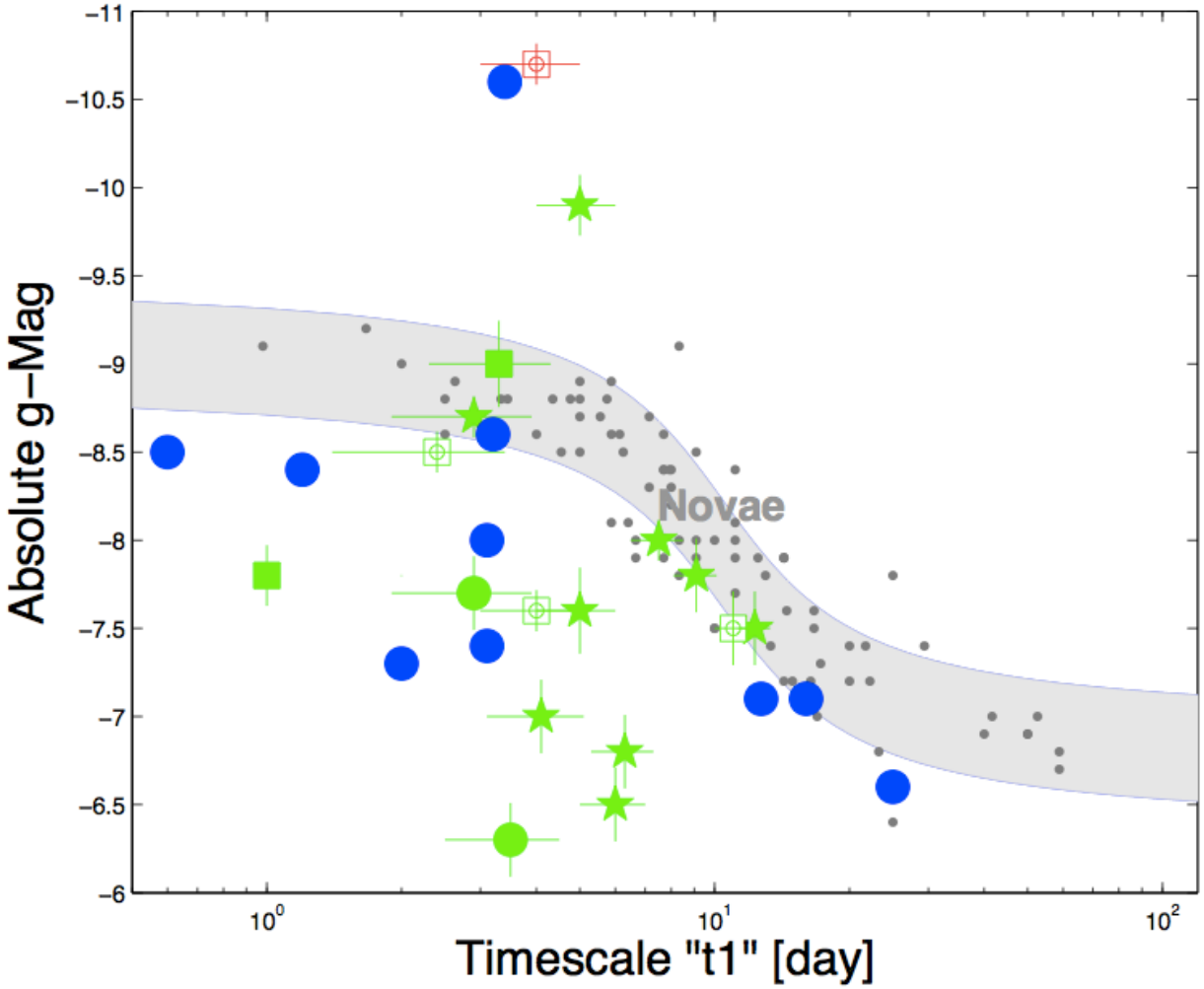
Faint and Fast Novae?





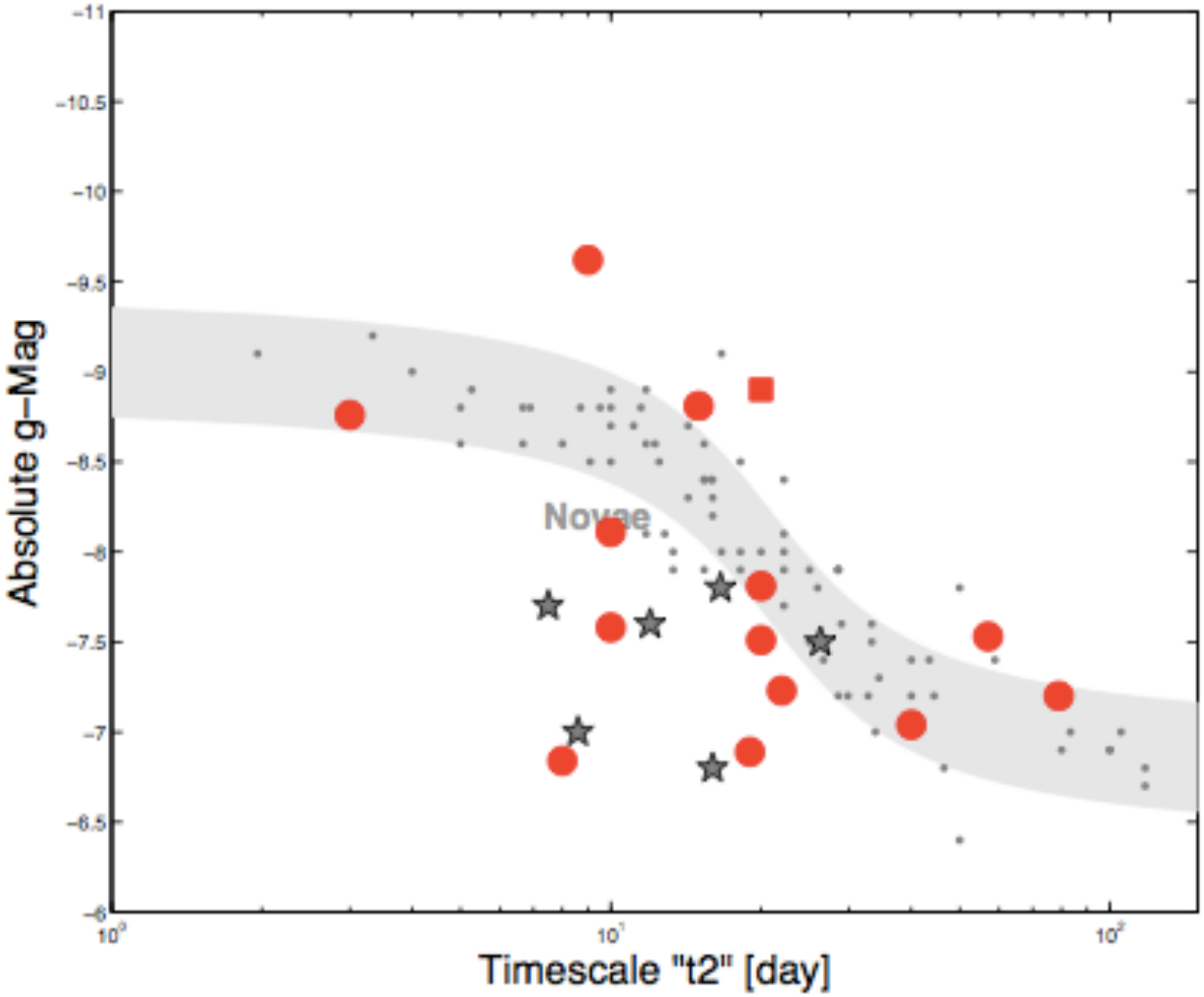
Kasliwal et al. 2010a

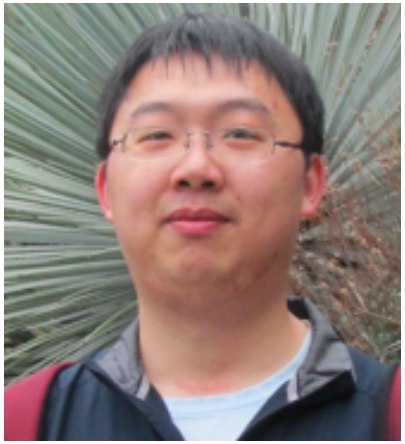
Recurrent Novae?



Kasliwal et al. 2010a, Schaefer 2010

The Test of Time





Cao, Kasliwal et al. 2012

SEZZ MEDI
1260 AMSTERDAM AVE.
NEW YORK, NY 10027

SAT NOVEMBER 13,2010
CHECK #324841-3
TABLE #33
DUPLICATE

2 Lemonade	$5.00
2 BAR GIN	$12.00
2 CANADIAN CLUB	$14.00
2 MARGARITA	$18.00
3 BTL C,PRIMITIVO	$90.00
1 BTL PINOT GRIGIO	$30.00
2 Gls POGGIANO CHIANT	$20.00
2 Sam Adams	$12.00
2 Stella Artois	$12.00
4 Sierra Nevada	$24.00
1 GLS PRELUDIO,CHARD	$9.00
	$246.00
TAX :	$21.83
SUB-TOTAL :	$267.83
GRATUITY :	$49.20
TOTAL	$317.03

HOPE YOU ENJOYED YOUR MEAL &
PLEASE COME AGAIN!
Private Party Room Available
FOR PARTIES OF 30 TO 40

To whom it may concern:

The MMRD is not a tight relation but a pseudo scatter diagram.

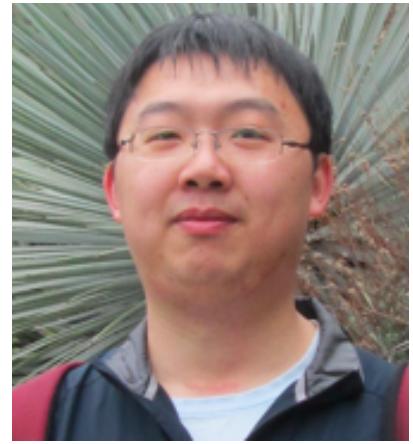
Witnessed

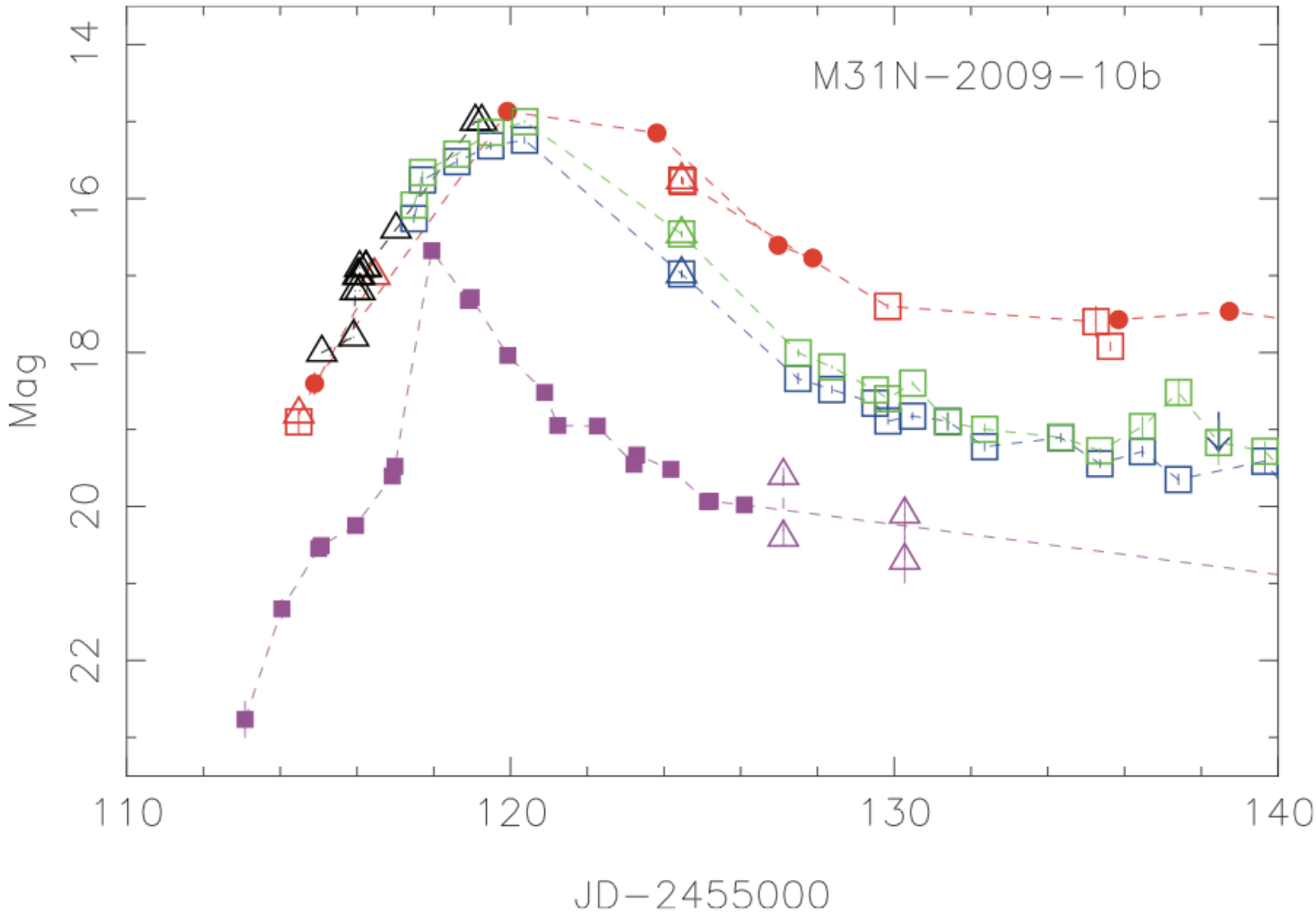
SRK

A Shaftin

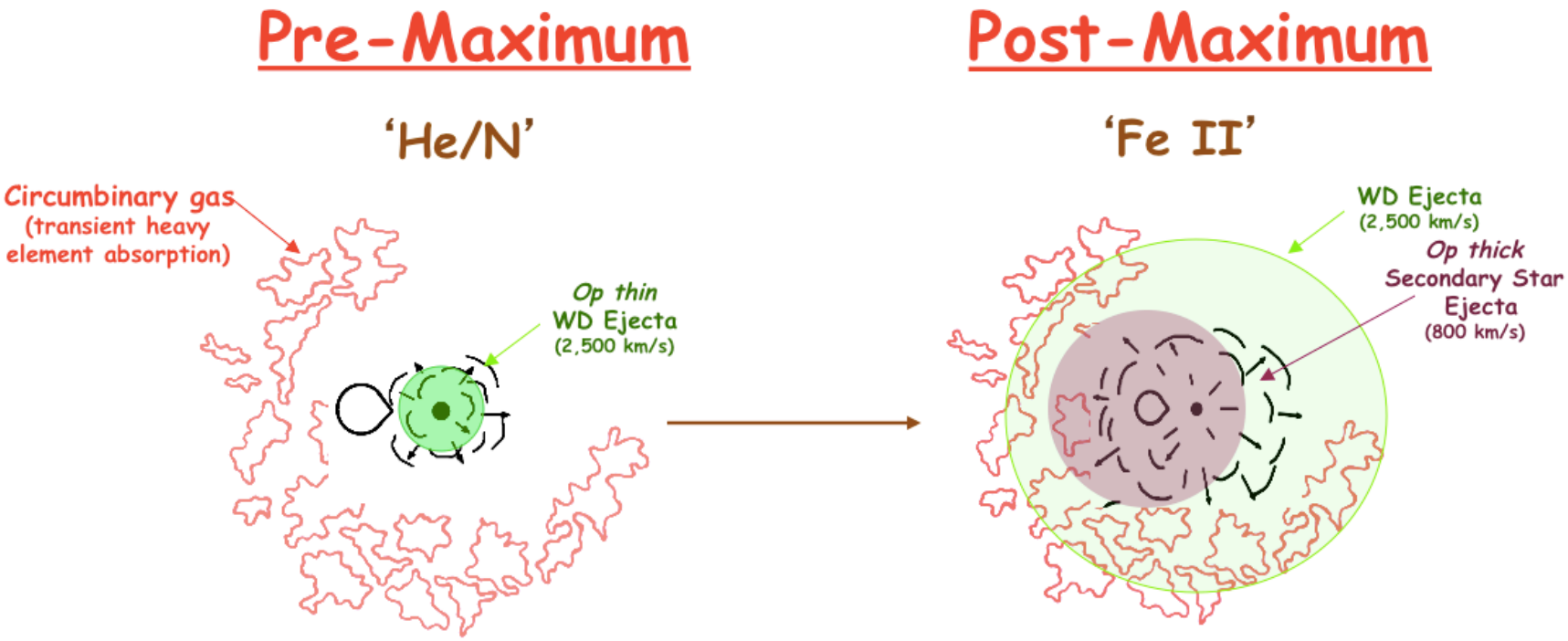
I was NOT the referee!

Ultra-violet

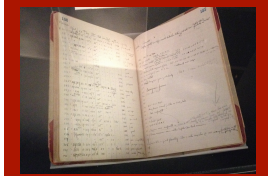




Cao, Kasliwal et al. 2012

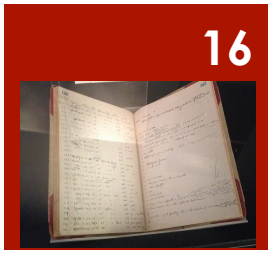
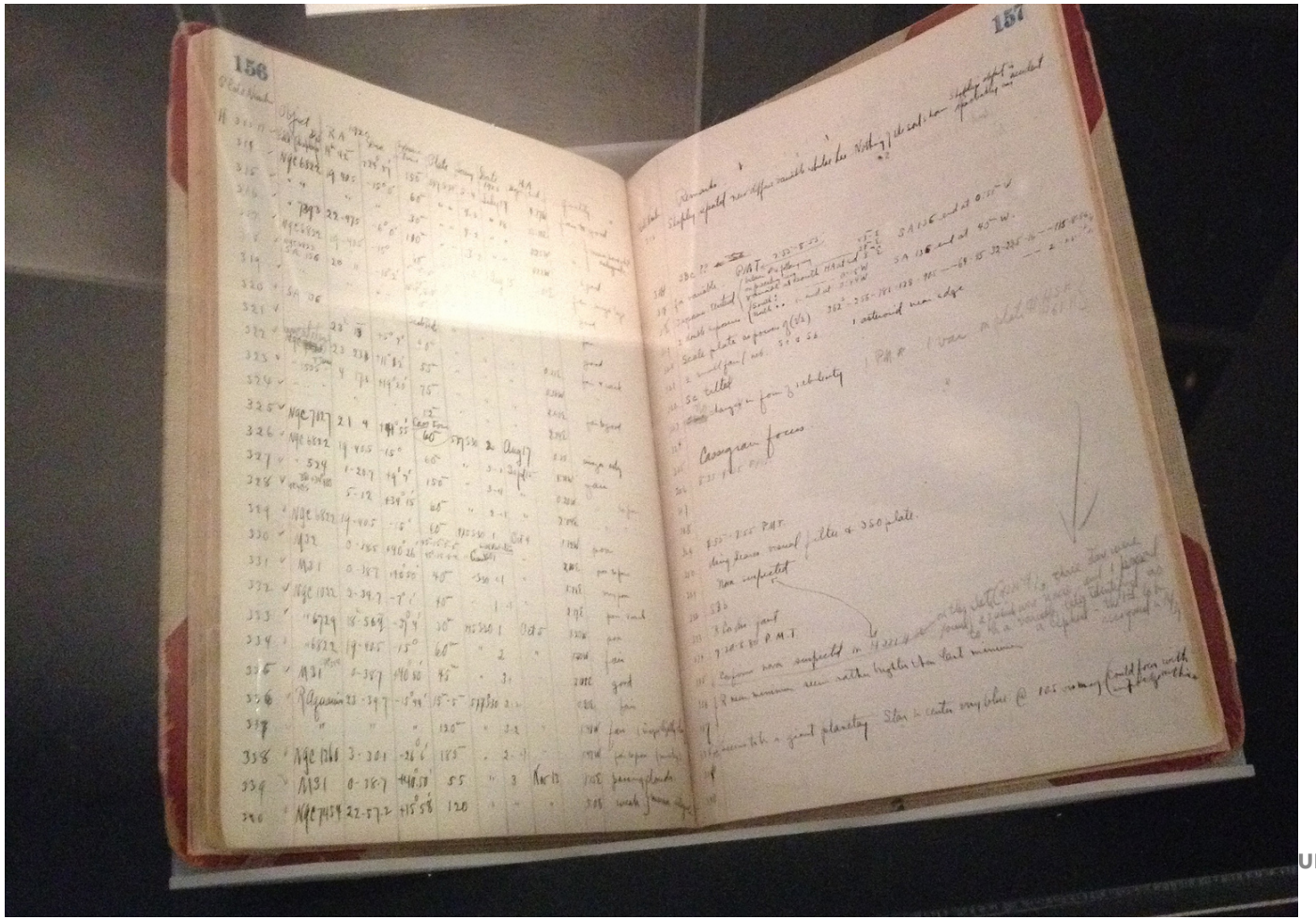


Slide from Bob Williams



Way Forward

- Nova Physics is Rich
  - Mass, Temperature, Accretion Rate, Composition of WD
- Spectra of young novae – do all novae start as He/N?
- Synergistic UV-optical light curves
- Companion/Environment Study (PHAT)



Thank You.