# Observing Programmes at Bronberg and Klein Karo Observatories

LAG (Berto) Monard

Bronberg Observatory (2001-20

Klein Karoo Observatory (201

# Discovering and observing objects in our galaxy and b

- Introduction to two Observat
- Five observing programmes
- Other observations

The Bronberg Observatory / CBA Pretoria
2001 as a private observatory. It is locate
Bronberg ridge, 40km east of Pretoria.

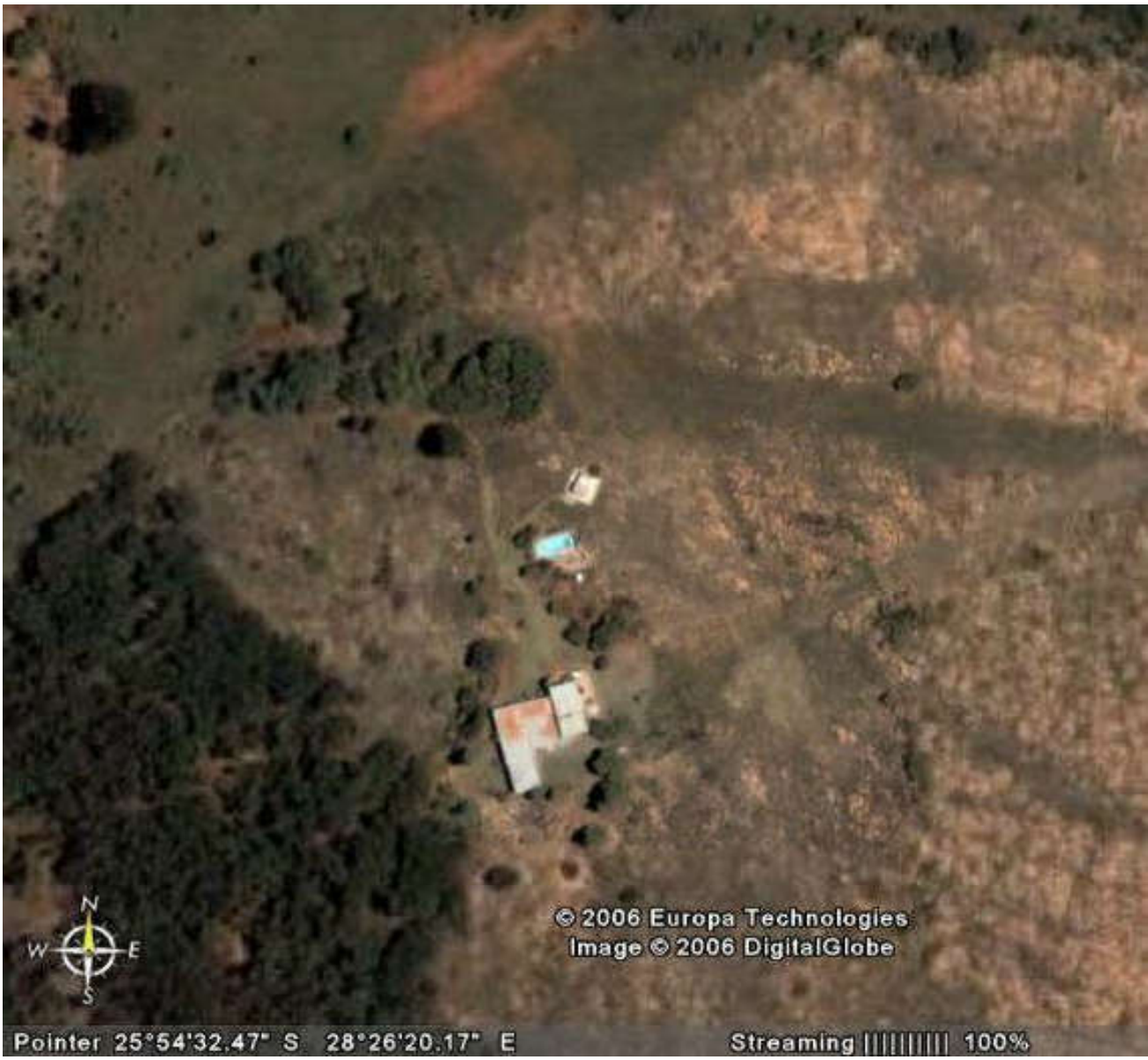
It closed down at the end of 2010, due t
to the W Cape.

**altitude: 1590m**

coordinates: 25 º 54' 32" S , 28º 26' 18" E

This region is part of the Highveld, a sum
area with unreliable weather and thunde
during summer, but with an abundance o
**during the long winter night**s.


N
E
S
W
Image © 2005 DigitalGlobe
Pointer 25°54'31.99" S 28°26'33.20" E
Streaming 100%


© 2006 Europa Technologies
Image © 2006 DigitalGlobe
Pointer 25°54'32.47" S 28°26'20.17" E
Streaming 100%

# Bronberg Observatory / CBA Preto

# Bronberg Observatory / CBA Pretoria a

# Roll off roof channel

# Roll off roof castor rod

October 2012 ASSA Symposium 2012, Cape Town

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October 2012 ASSA Symposium 2012, Cape Town

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October 2012

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# Anti-crepuscular rays

# Instrumentation 2001

- Schmidt Cassegrain Telescope (Mea
  Classic) 30 cm f/10
- CCD camera SBIG ST7-XME
- Filterwheel (BVRI&clear)
- 0,33x focal reducer / field flattener g
  effective f/3.7
- Image size: 21 x 14 arcmin
- Pier-wedge mounted, polar aligned

# Instrumentation

# Front view onto (coated) correct

# Pier and dew cap

# CCD camera train

# Instrumentation 2007

- Meade RCX400 30cm f/8
- CCD camera SBIG ST7-XME
- Filterwheel (BVRI&clear)
- 0,62x focal reducer / field flattener g
  effective f/5
- Image size: 14x11 arcmin
- Pier-wedge mounted, polar aligned

# New RCX400 scope

October 2012

ASSA Symposium 2012, Cape Town

# Klein Karoo Observator

The KK Observatory (CBA KK) was built in 201
outskirts of the small town Calitzdorp, loca
touristic R62 in the middle of the Little Kar
semi-desert region in the Western Cape, 4
Cape Town.

altitude: 225m

coordinates: 33º 32' 05" S , 21º 40' 49" E

The region is part of the winter rainfall area v
cloudy nights during winter while the sum
and dry with about 30% open skies at nigh


Calitzdorp, Sout
© 2009 Cnes/Spot Image
Pointer 33°32'03.17" S 21°41'05.51" E elev 226 m
Streaming 100%


October 2012 ASSA Symposium 2012, Cape Town

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October 2012 ASSA Symposium 2012, Cape Town

# Rose of the Karoo

October 2012

ASSA Symposium 2012, Cape Town

October 2012 ASSA Symposium 2012, Cape Town

# Instrumentation

- Meade RCX400 telescopes 30 and 3
- CCD cameras SBIG ST8-XME
- Filterwheel (BVRI&clear)
- Mostly used in binned mode (seeing
- Image size: 21 x 14 arcmin
- Pier-wedge mounted, polar aligned

# Observing programm

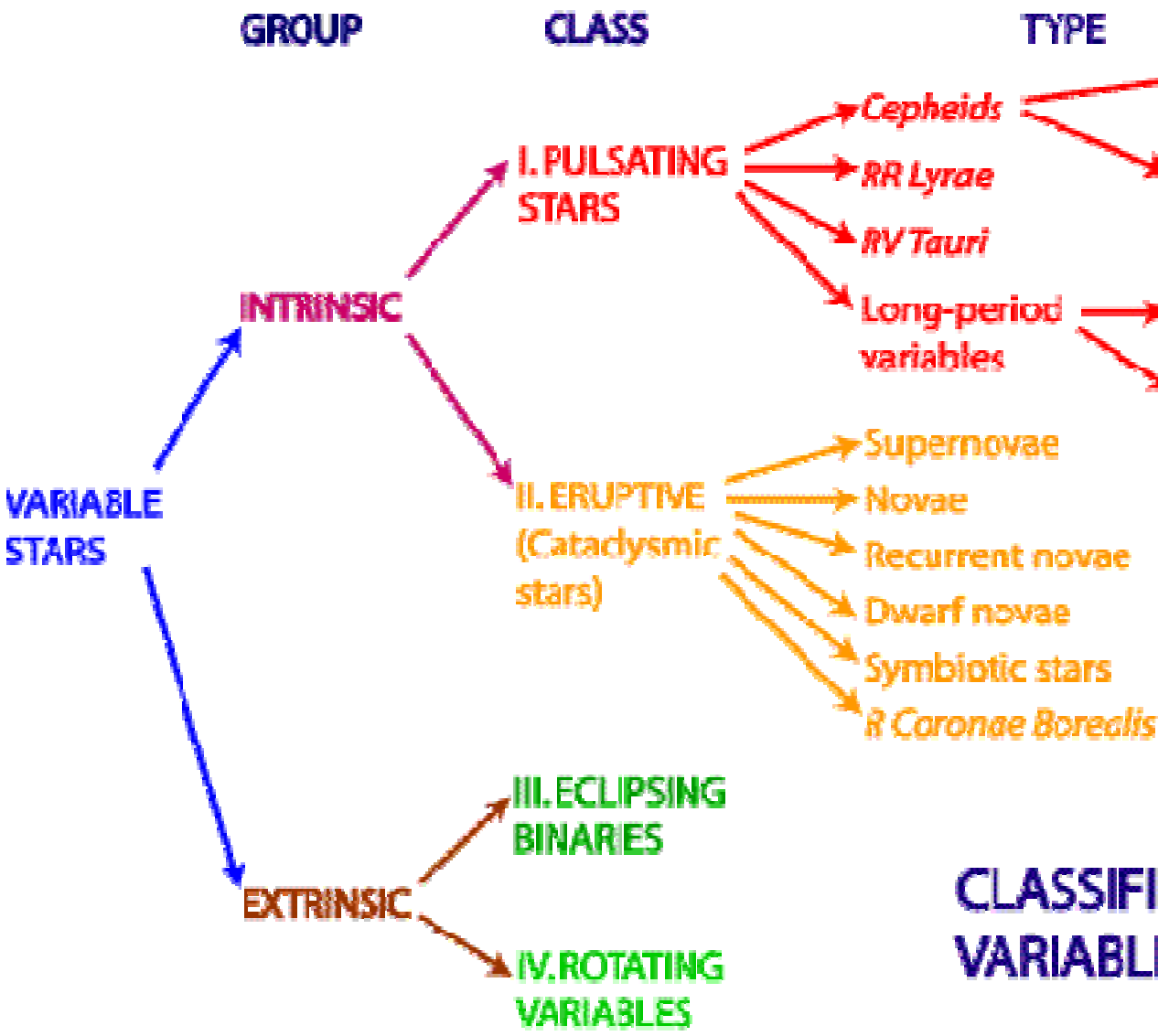
- Cataclysmic variables (CVs):
  - Long term monitoring of faint
  - Timeseries Photometry (CBA, exploration)
- Supernova searching
- Symbiotic stars
- Microlensing events (uFUN)

# Variable stars

Variable stars are stars that show va
brightness.

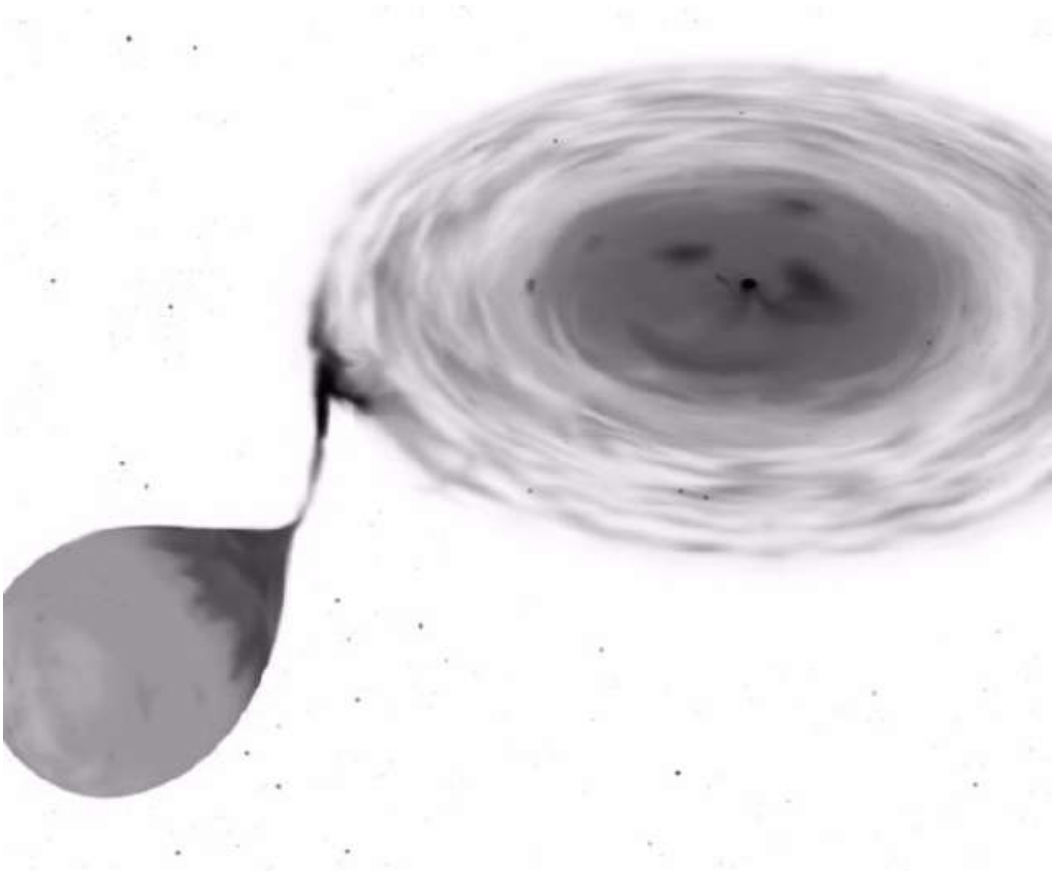
The main reasons for this are:

- Intrinsic variability of the star (pulsa
- Variability caused by outside factors
  eclipse by companion, microlens..)
- Combination of both (cataclysmic bi


GROUP
CLASS
TYPE
VARIABLE STARS
INTRINSIC
EXTRINSIC
I. PULSATING STARS
II. ERUPTIVE (Cataclysmic stars)
III. ECLIPSING BINARIES
IV. ROTATING VARIABLES
Cepheids
RR Lyrae
RV Tauri
Long-period variables
Supernovae
Novae
Recurrent novae
Dwarf novae
Symbiotic stars
R Coronae Borealis
CLASSIFI
VARIABL

# Cataclysmic variable star

- CVs are part of a wide group of interacting b
  which one of the members is a white dwarf
- Most CV systems are compact with orbital p
  between 1.5 and 8 hours. They might show
  behaviour over those periods which can be s
  observations from one night.
- Most CVs undergo stages of increased activit
  novae undergo normal and super outbursts
  respectively short (2-3 days) and long (2-3 w
  duration.
- Magnetic CVs tend to evolve between high a
  states



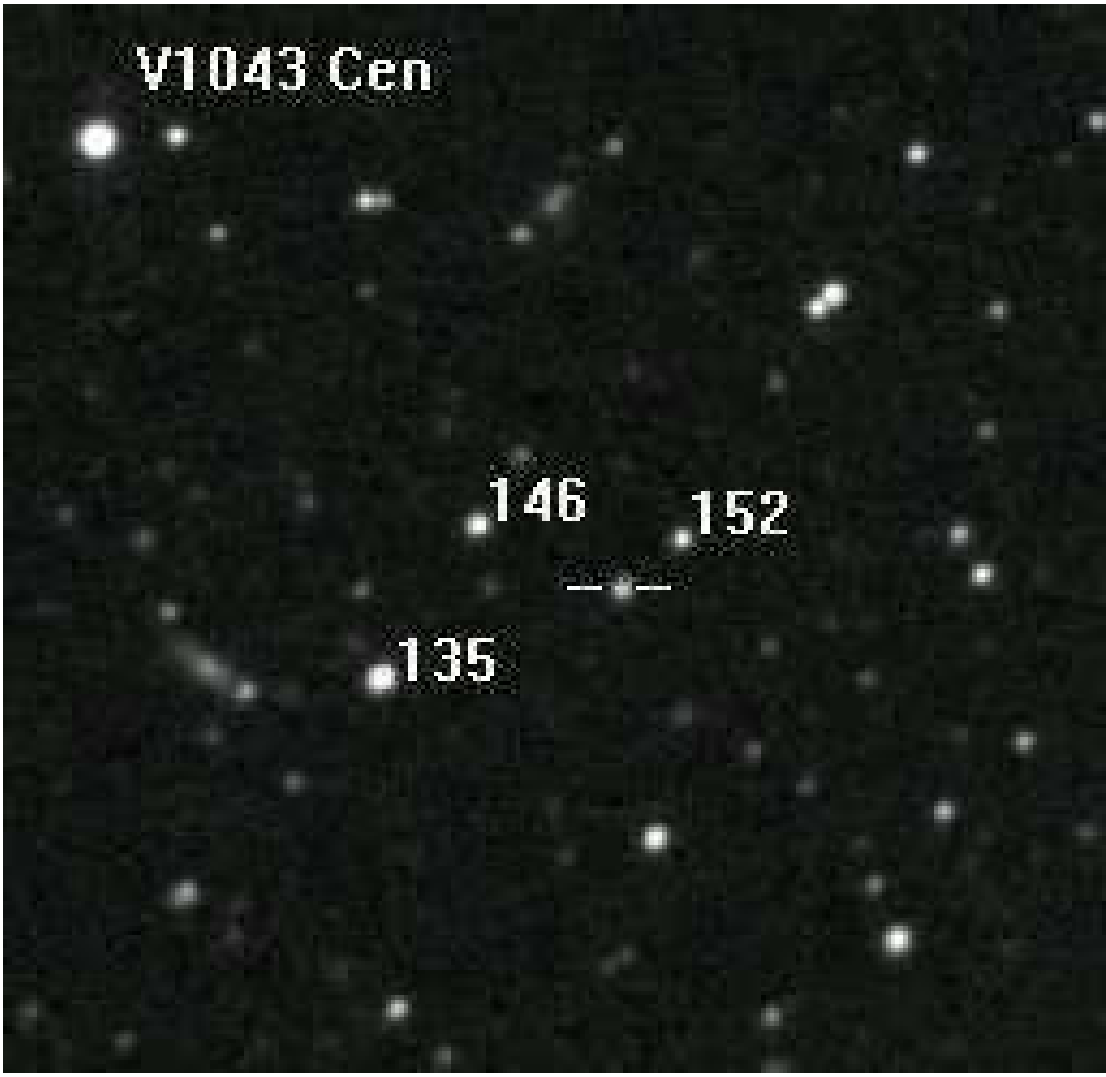
**Cataclysmic variable / schematic**

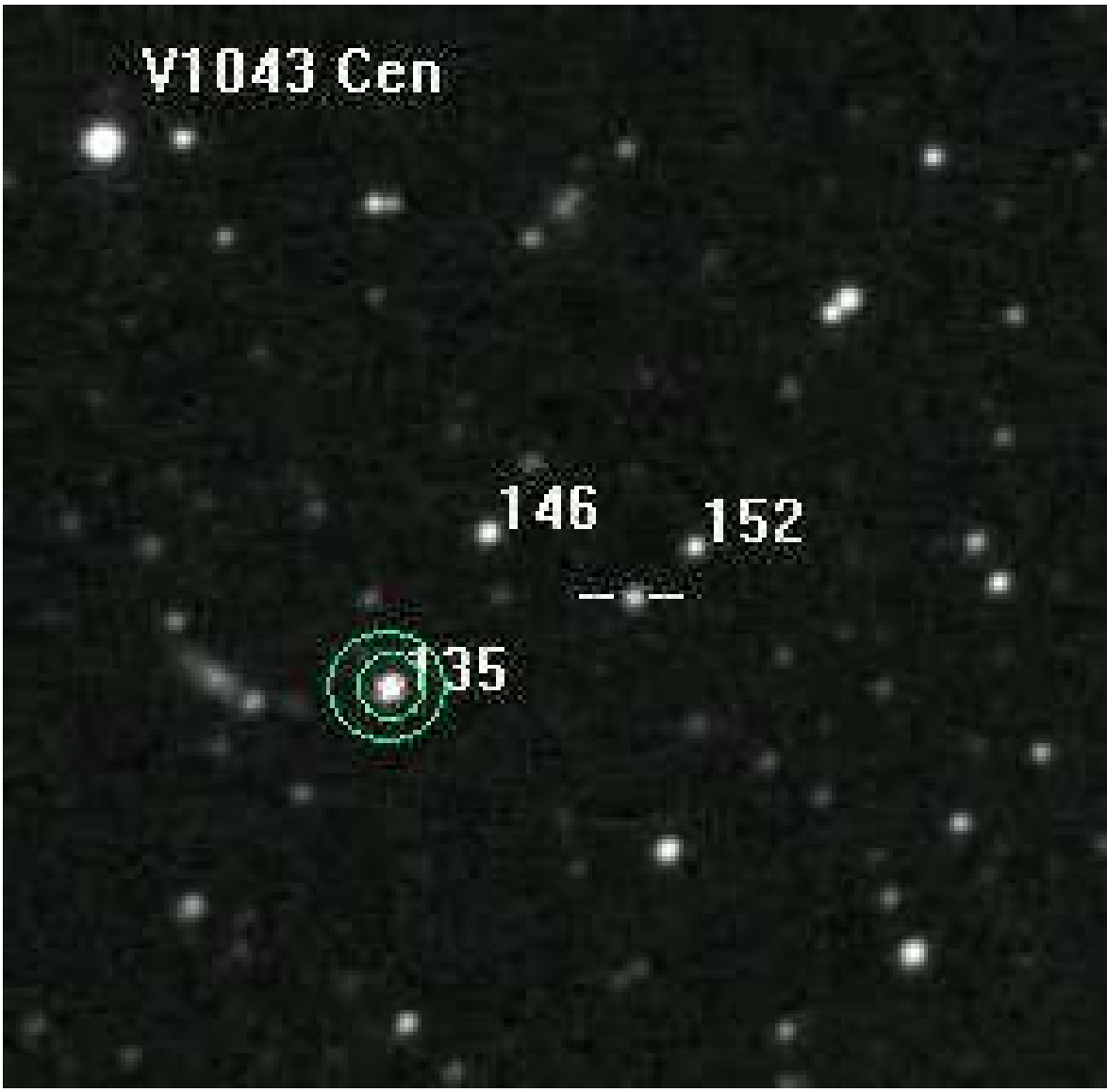
CVs are interacting binaries of which one memb
is a white dwarf

# Differential photometr
## applied to CCD images

- Measurement of a star's brightness
  comparison to that of another star i
  same field.
- The comparison star must be known
  constant light output.
- Using multiple comparison stars is 's
  better.

# Star chart for V1043 Cen (R mag




V1043 Cen
146
152
135

# CCD Observing Programmes

**Timeseries photometry of CVs**

Observing the same target over many hours nights and derive the light variation.

- As participant (CBA Pretoria) in observing ca organized by the Centre of Backyard Astroph HQ at the Astronomical Department of the C University. CBA network covers many timezo
- Complementing satellite based observations XR binaries
- Follow up on alerts of rarely outbursting dwa search of periodicity, often in collaboration v Variable Star network (VSNET)
- Exploration targets (unknown CVs, XR source old novae, MPs and exoplanets)

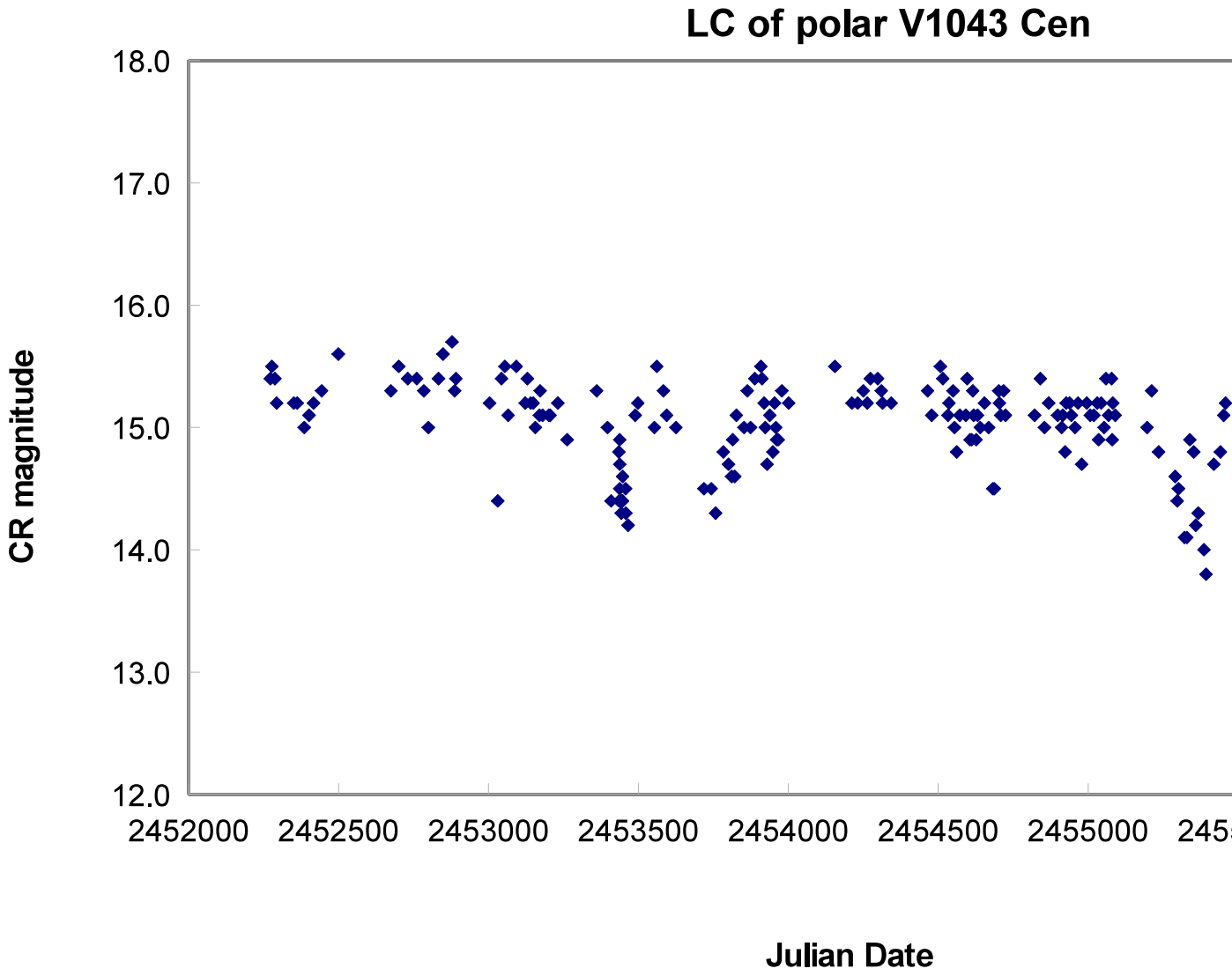
# CCD Observing Programmes

## Periodic CV monitoring

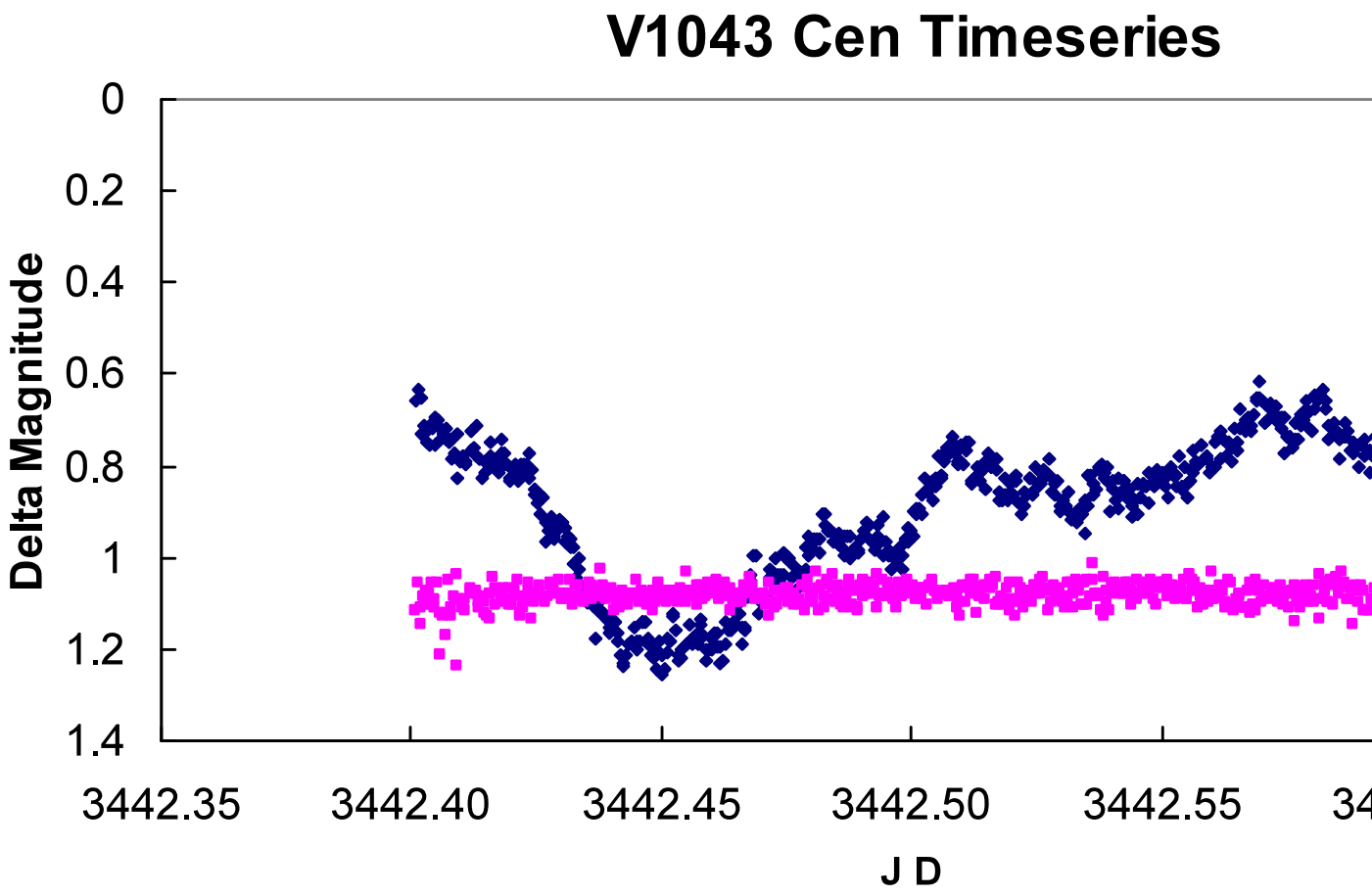
- Faint cataclysmic variables (CVs) have bee
  monitored at CBA Pretoria since May 200
  CCD camera on a 30cm SCT, usually unfilt
- Observing programme has been updated
- Observations are done unfiltered to prob
  and to increase precision. Usually 4 imag
  per target which are then calibrated and
  stacked. Limiting magnitude is typically >

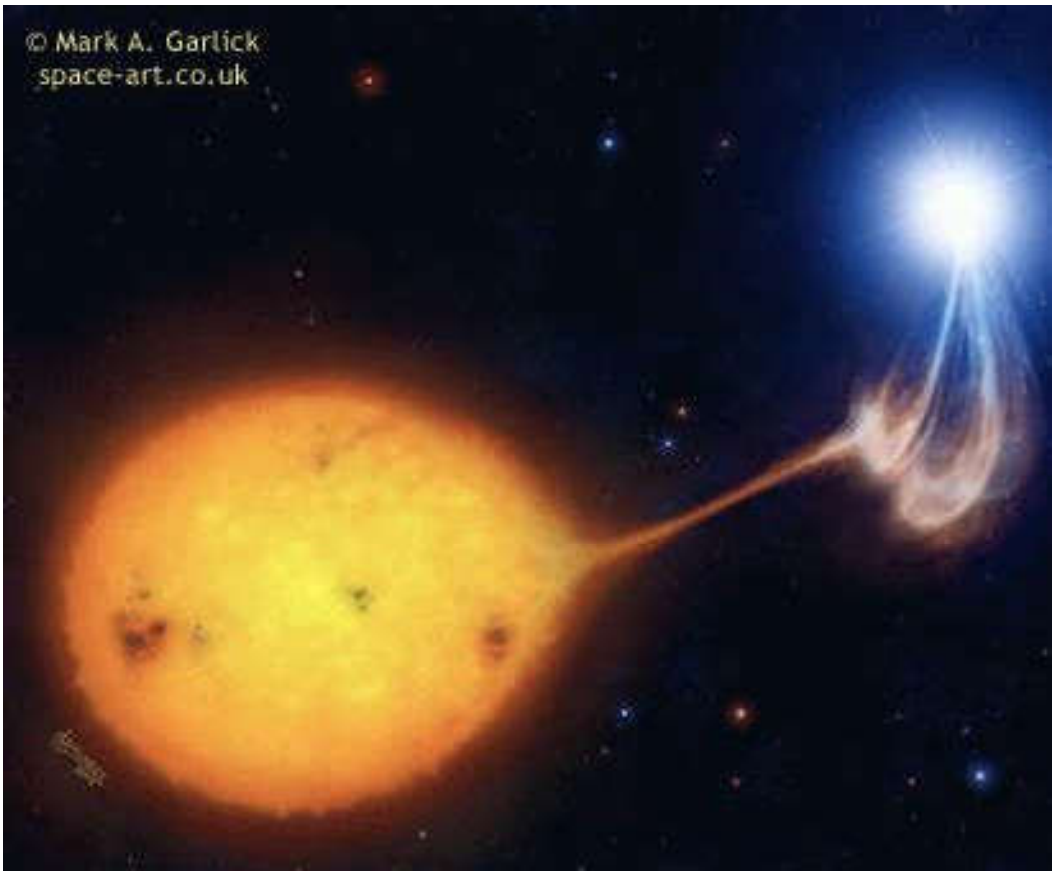
# V1043 Centauri

- **GCVS Name:** V1043 Cen
- **Other Name:** RX J1313-3259
- **RA:** 13:13:17.14
- **DEC:** -32:59:12.2
- **Object Type:** am
- **Magnitude Range:** 16 V -
- **Period:** 0.174592d


LC of polar V1043 Cen
18.0
17.0
16.0
15.0
14.0
13.0
12.0
CR magnitude
2452000
2452500
2453000
2453500
2454000
2454500
2455000
Julian Date

# Timeseries photometry of V10

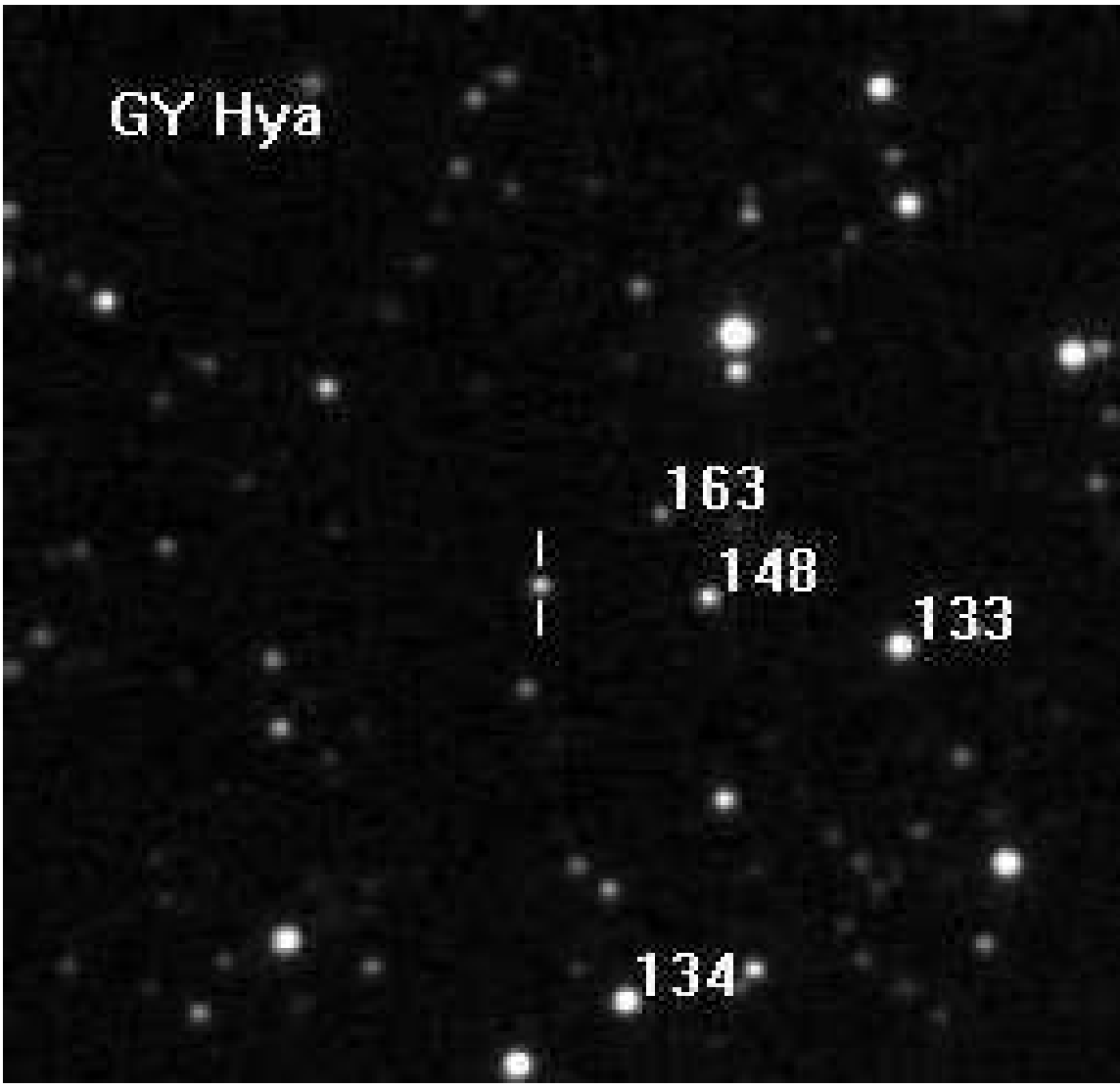




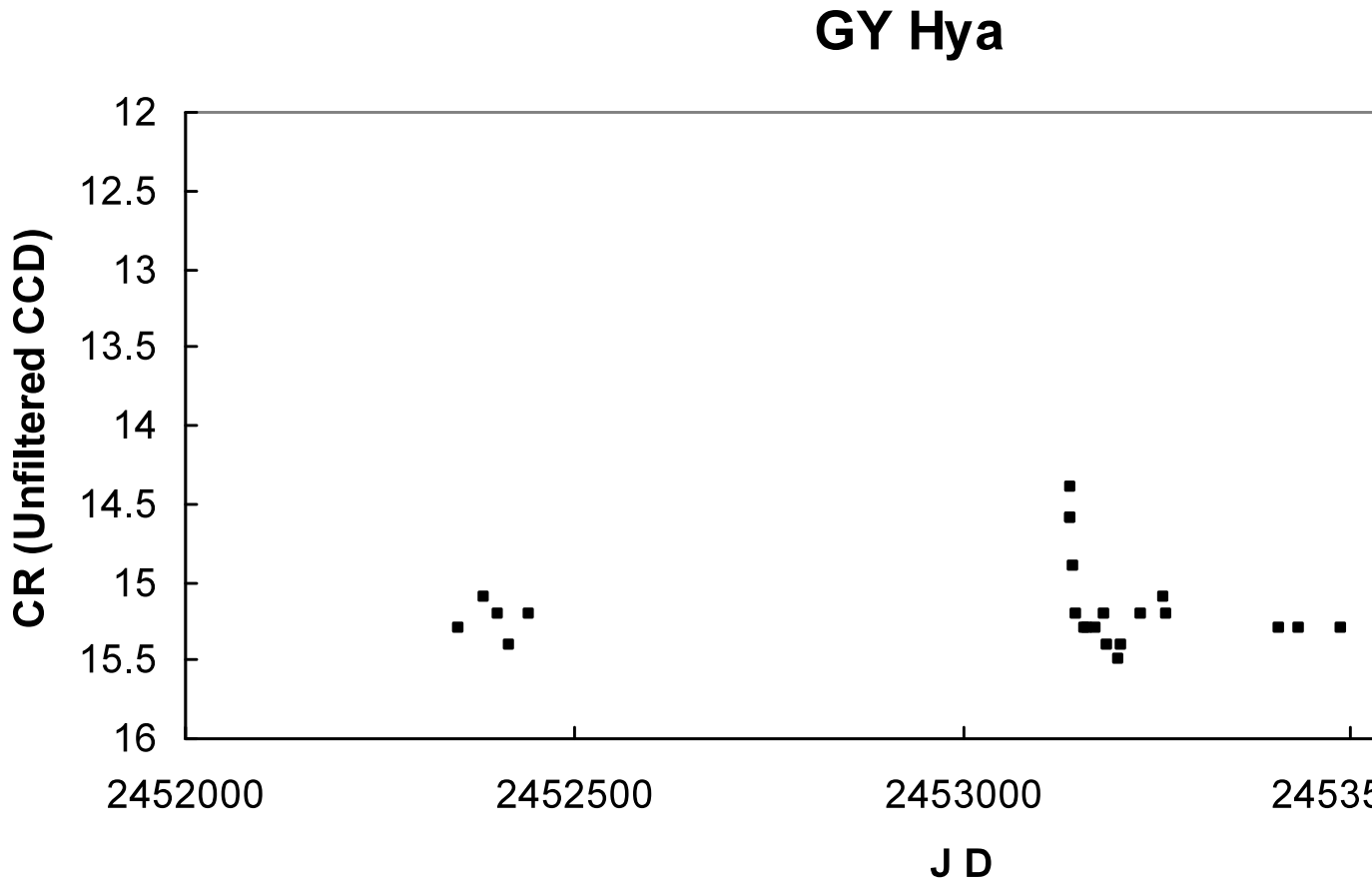

## Schematic presentation of a Polar

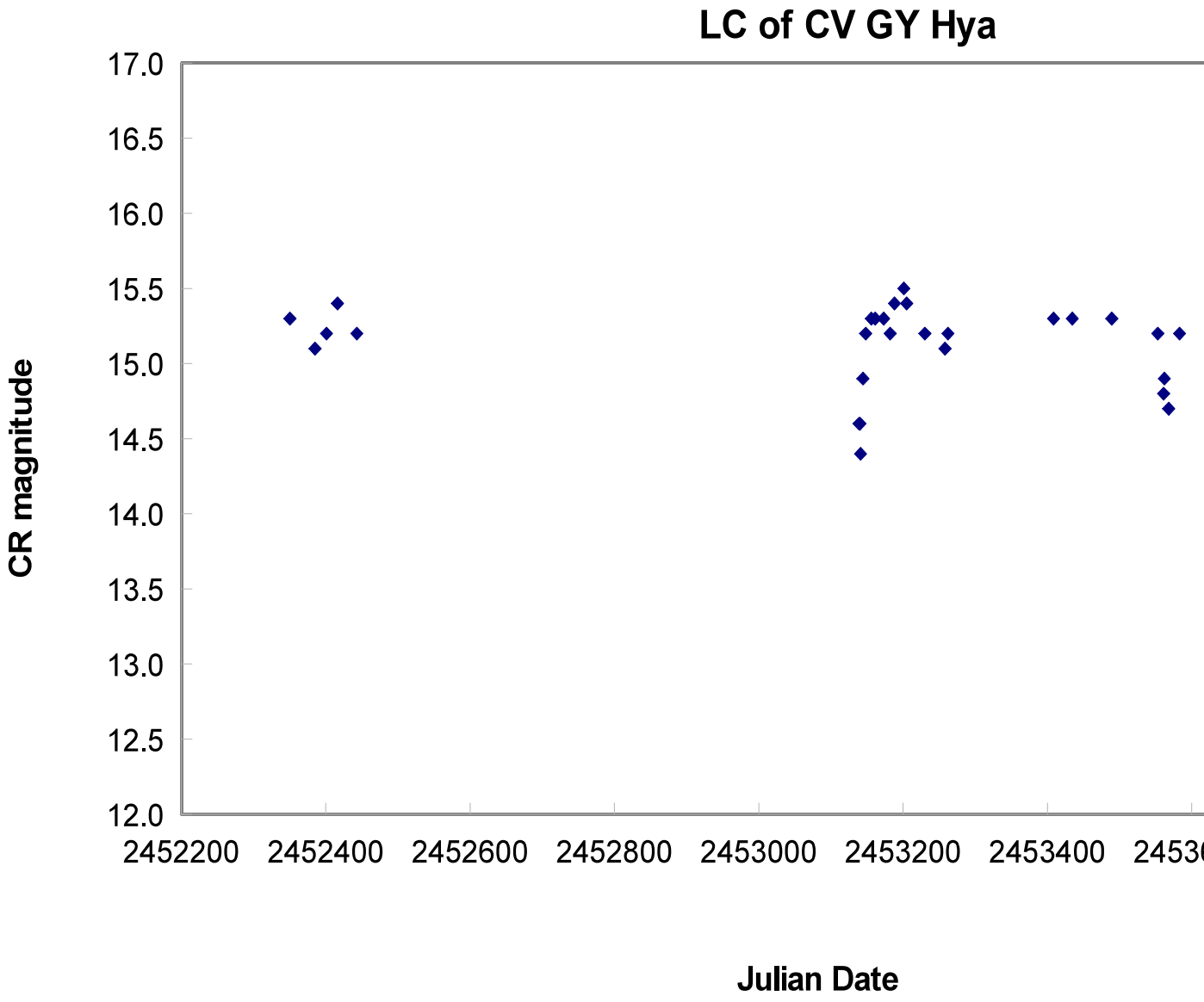
Polars are  CVs with a strongly magnetic white dwarf,
accretion disc can form and the transferred material i
dumped onto the poles.

# Star chart derived from observatio

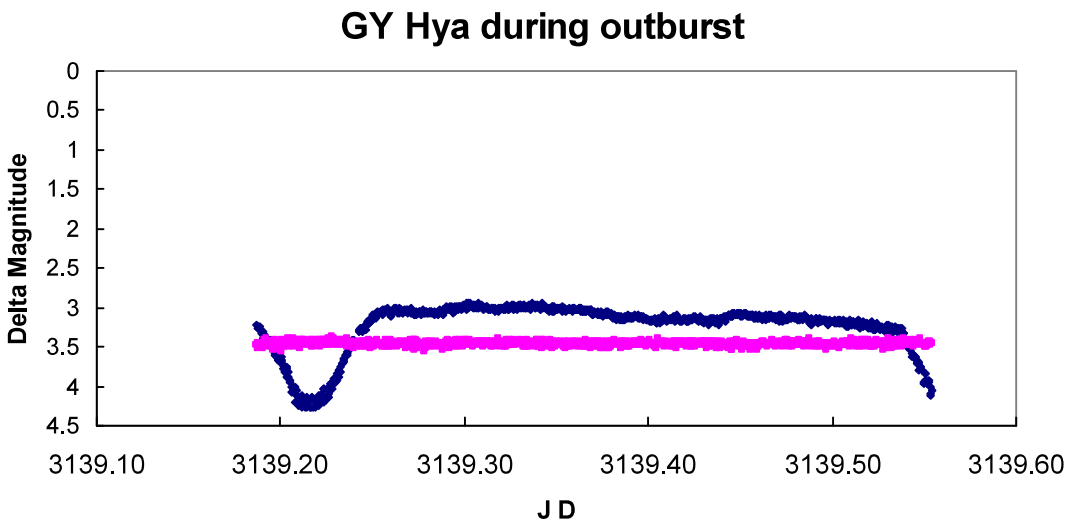


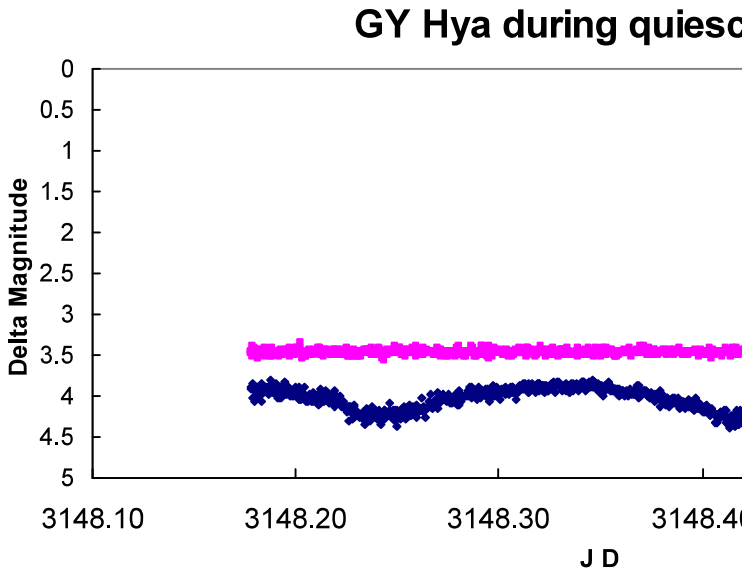
# Long term light curve of GY




LC of CV GY Hya
CR magnitude
17.0
16.5
16.0
15.5
15.0
14.5
14.0
13.5
13.0
12.5
12.0
2452200
2452400
2452600
2452800
2453000
2453200
2453400
Julian Date

# Nightly timeseries of GY Hya



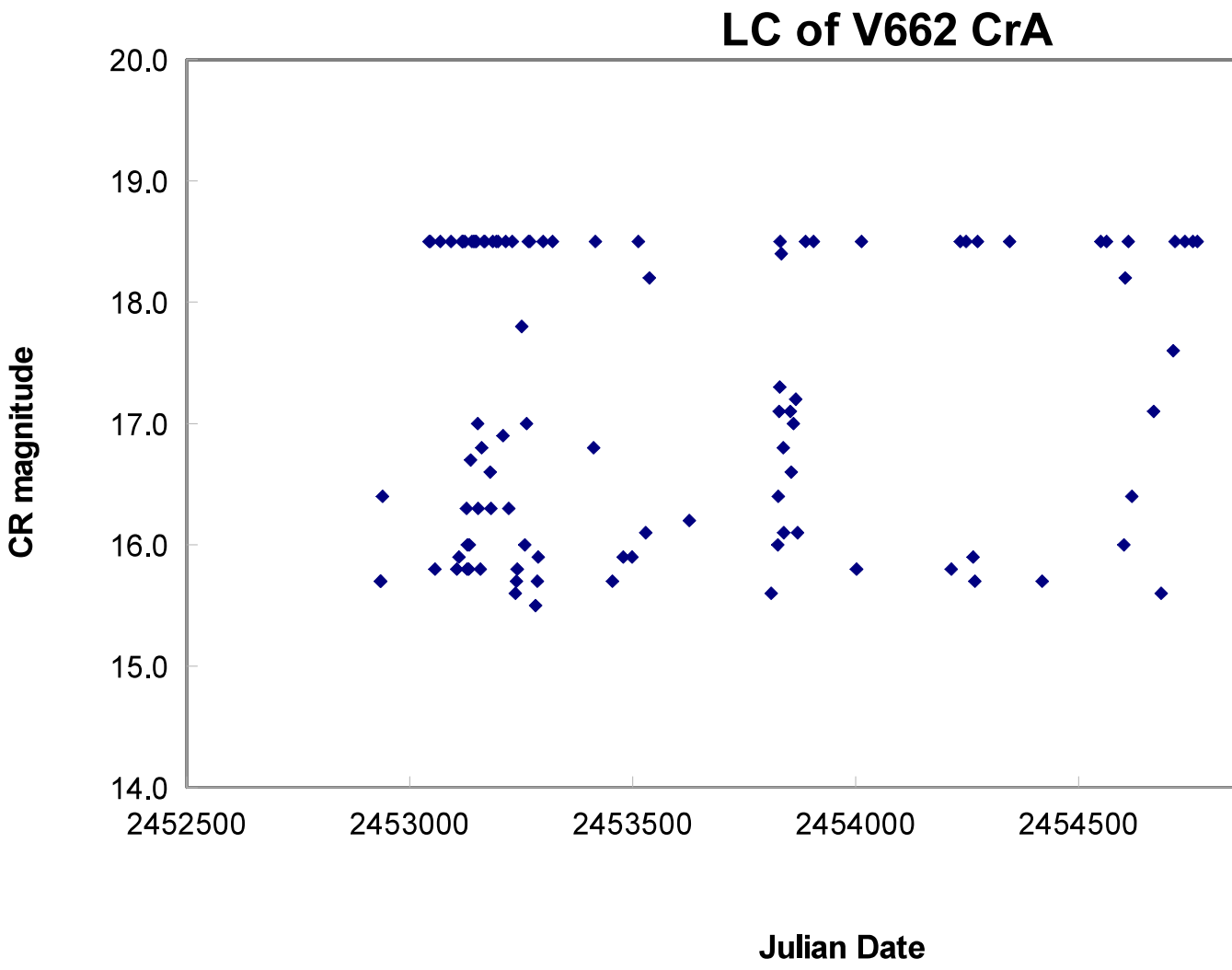



# GY Hydrae

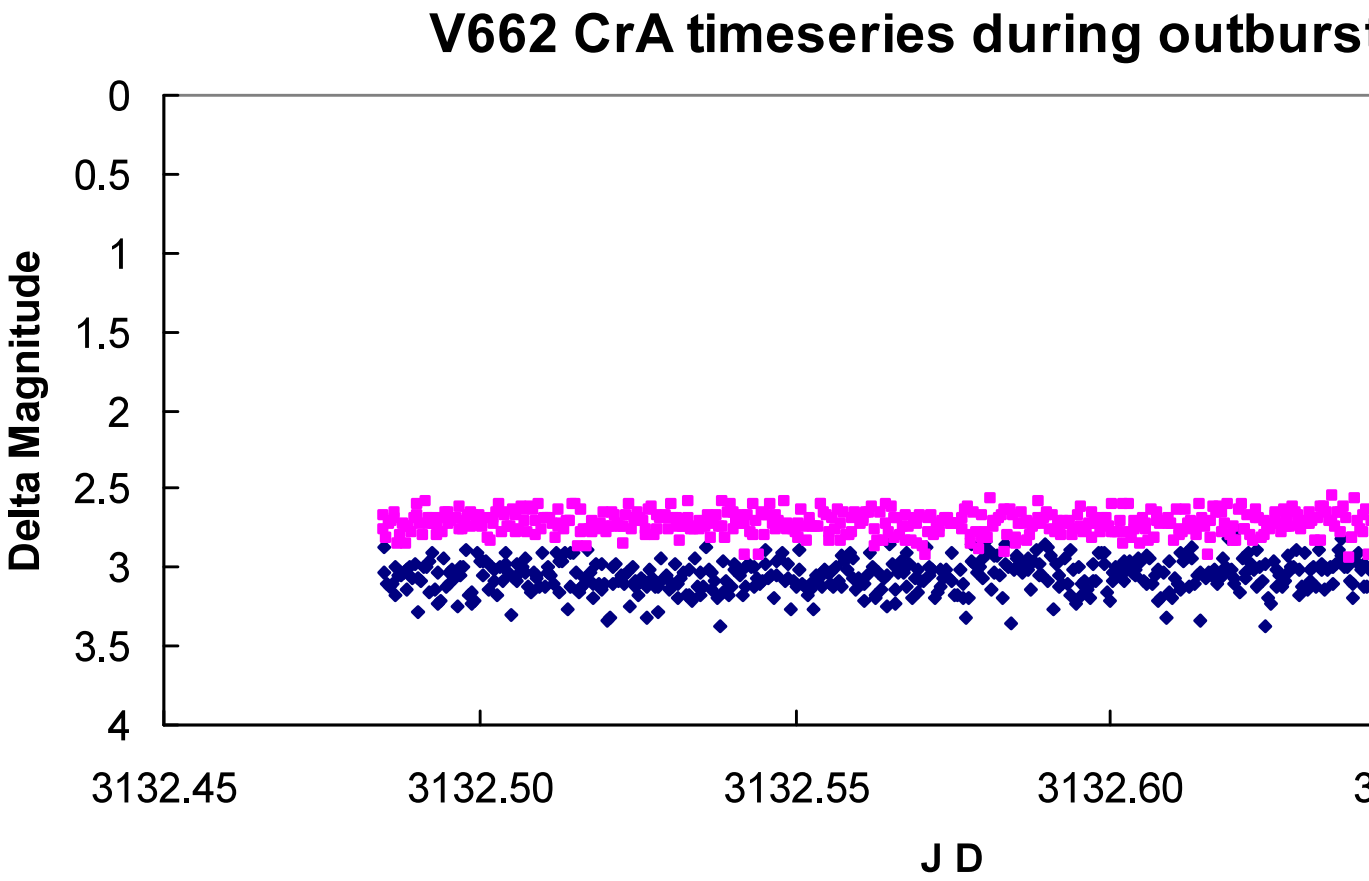
- **GCVS Name:** GY Hya
- **Other Name:** S 6576
- **RA:** 14:30:30.47
- **DEC:** -25:52:38.0
- **Object Type:** ug
- **Magnitude Range:** 14 p - 16 p
- **Period:** 0.347237d

# V662 Coronae Austri

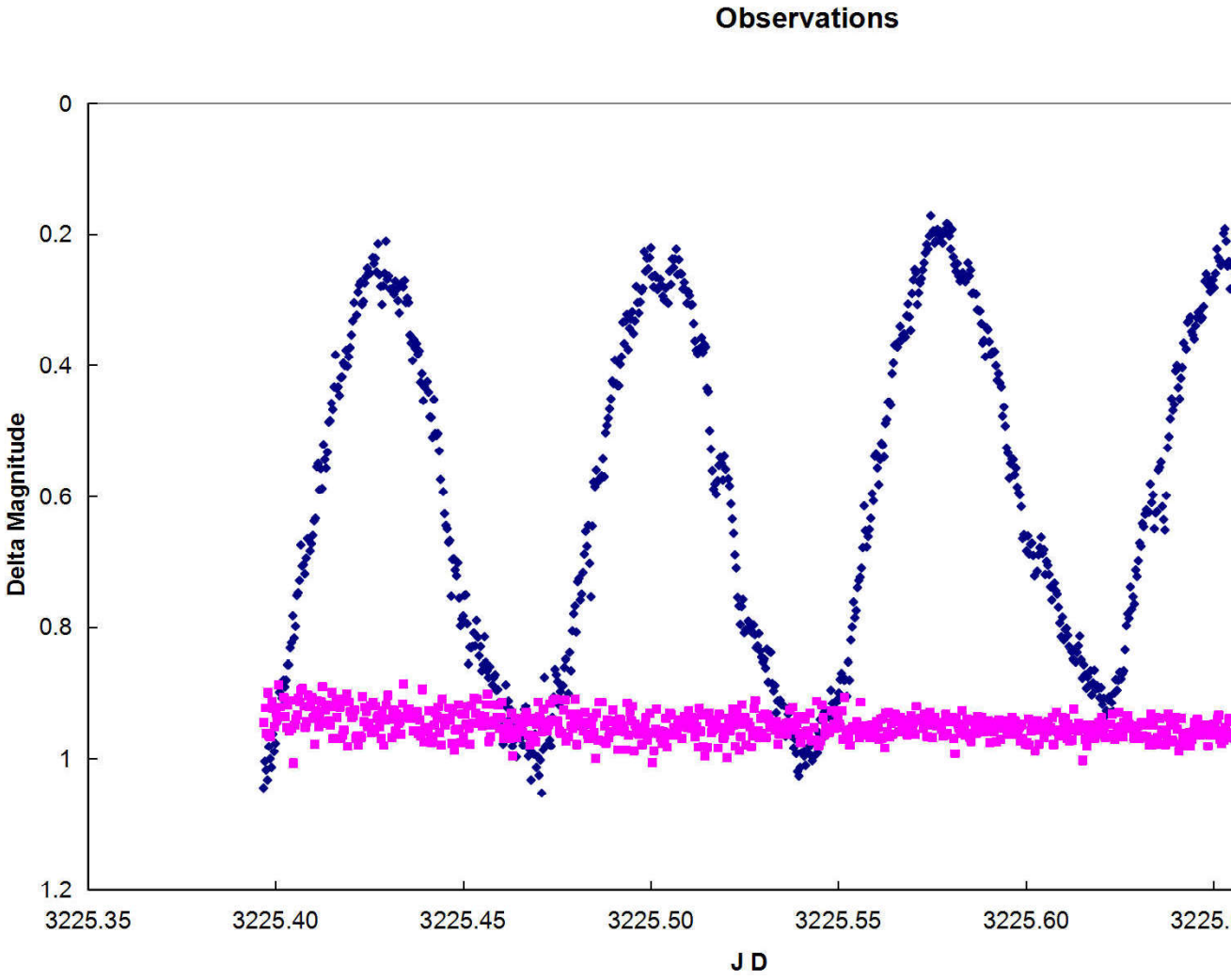
- **GCVS Name:** V662 CrA
- **Other Name:** Plaut 3-1235
- **RA:** 18:35:30.53
- **DEC:** -36:56:44.7
- **Object Type:** ug
- **Magnitude Range:** 15.7 p - <19.6
- **Period:** -


LC of V662 CrA
20.0
19.0
18.0
17.0
16.0
15.0
14.0
CR magnitude
2452500
2453000
2453500
2454000
2454500
Julian Date

# Timeseries photometry of V66



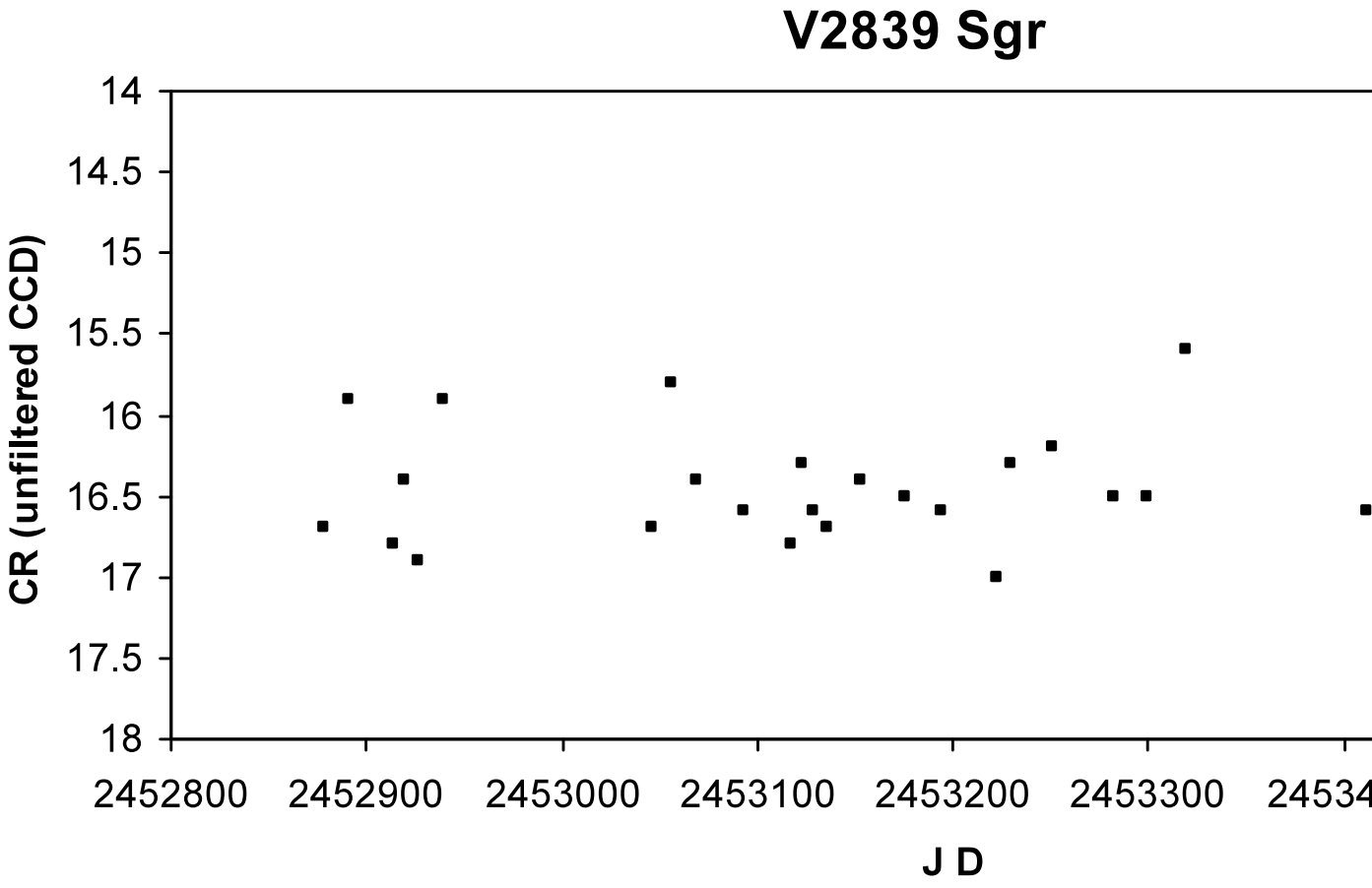
# VW Hyi superoutburst



# V2839 Sagittarii

- **GCVS Name:** V2839 Sgr
- **Other Name:** Plaut 3-281
- **RA:** 18:16:19.29
- **DEC:** -31:42:09.8
- **Object Type:** UG:
- **Magnitude Range:** 15.3 p - 17.2 p
- **Period:** -

# Long term light curve of V28



# Timeseries photometry of V28