

SPA Variable Star Section.

Annual Report 2022.

Over the course of 2022, Doug Allen, Matthew Barrett, Steve Harrison, Tracie Heywood, Paul Kitchen, Don Matthews, Jonathan Shanklin, Bob Steele and Edward Sawyer, all contributed observations to the section. Both Edward Sawyer, Steve Harrison and Paul Kitchen are new to the section, so hopefully we'll receive more observations from them in the future.

All of these observations were visual, except for the photometric observations of Don Matthews and the spectroscopic observations of Steve Harrison.

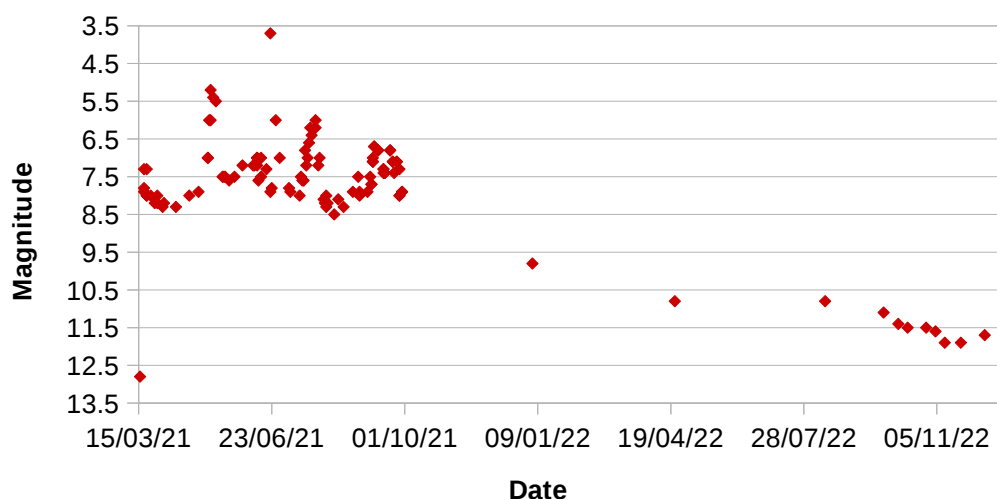
Nova Cassiopeia 2021 – V1405.

One of the biggest events of 2021 was the discovery of nova Cassiopeia 2021. Nova Cassiopeia, or V1405 Cassiopeia as it has now been designated, was discovered in March 2021 by the Japanese astronomer Yuji Hakamura, and it became the brightness nova seen from the UK since nova V399 Delphini 2013.

Nova V1405 Cassiopeia had fallen below the ninth magnitude by the end of 2021, so was no longer visible to binocular observers, however some of our members were able to continue their observations as the star faded over the course of 2022. Don Matthews in particular was able to keep making observations until the star fell below twelfth magnitude. V1405 Cassiopeia now seems to have returned to its original brightness, before it went into outburst.

Light Curve for V1405 Cassiopeiae.

2021 - 2022



R Bootis.

R Boo

7.2 – 12.3

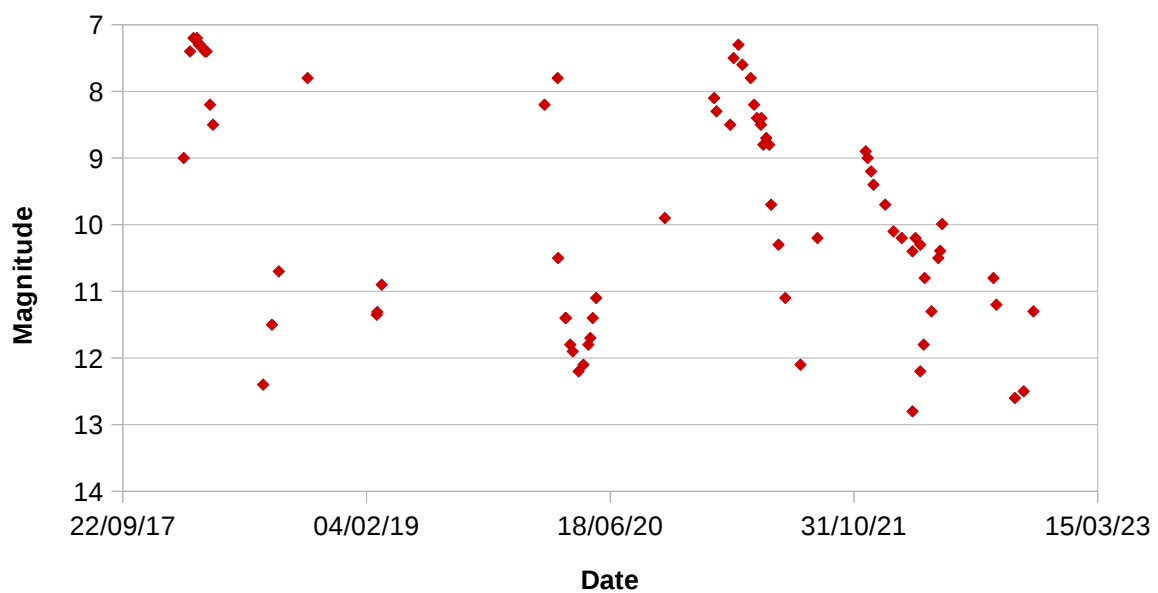
224d

Mira

The number of observations of R Bootis, received by the variable star section, has increased over the last couple of years, so we are able to make a more accurate light curve. R Bootis has been followed over the course of two complete cycles of variation. Over the course of 2020-2021, R Bootis had a typical range of just under twelfth magnitude, to just under seventh magnitude. However, during 2021-2022, R Bootis seemed to have peaked at just over ninth magnitude. It also seems to have a slightly fainter minimum, at just over thirteenth magnitude.

Light Curve for R Bootis.

2018 - 2022



RW Bootis.

RW Boo

7.4 - 8.9

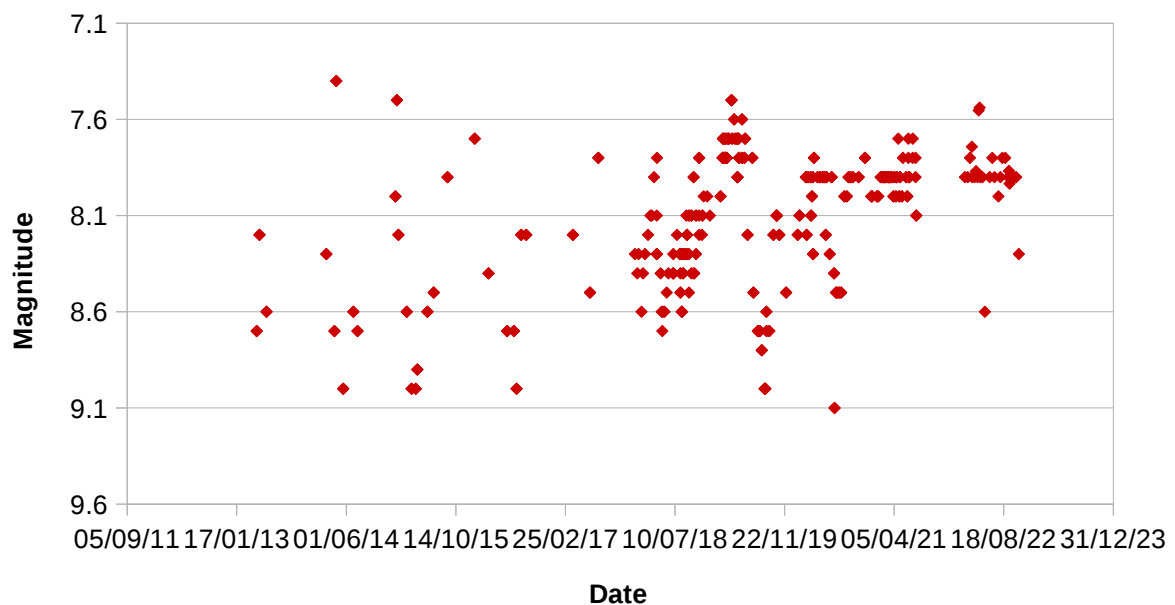
209d

SR

The number of observations of RW Bootis, that we have made over the course of the last couple of years, has also increased,. These observations seem to indicate that the range of RW Bootis is narrower then in previous years. Over the course of 2021-2022, there doesn't appear to show much more then half a magnitude variation.

Light Curve for RW Bootis.

2018 - 2022



Mu Cephei.

Mu Cep

3.4 – 5.1

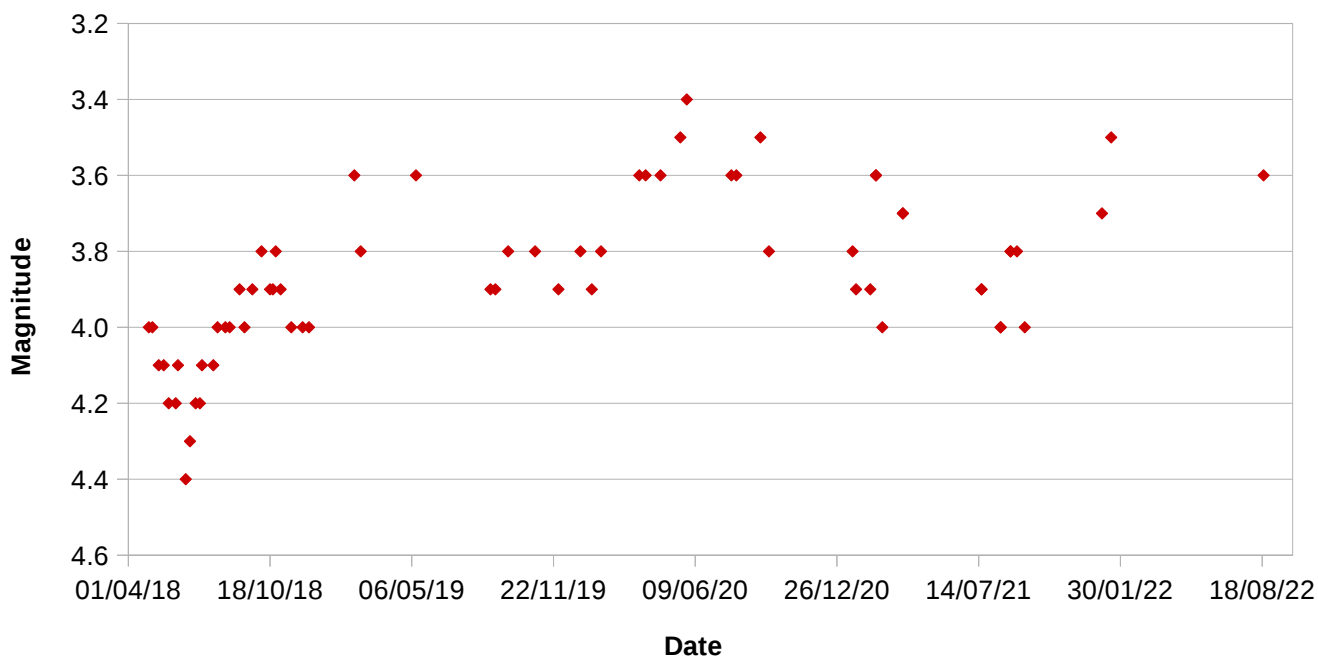
850d

Irr

As you might expect from an irregular variable, Mu Cephei shows a fair amount of scatter, with no readily discernable period. However, there is a vague indication of a period of approximately 600 days, as Mu Cephei had a minimum in November 2019, and another in July 2021. During 2018, Mu Cephei showed a particularly sharp and deep minimum, which has not been repeated. Over the course of 2019-2022, the magnitude of Mu Cephei has not dropped below the fourth magnitude.

Light Curve for Mu Cephei.

2018 - 2022



Omicron Ceti (Mira).

Omicron Cet

1.7 – 10.1

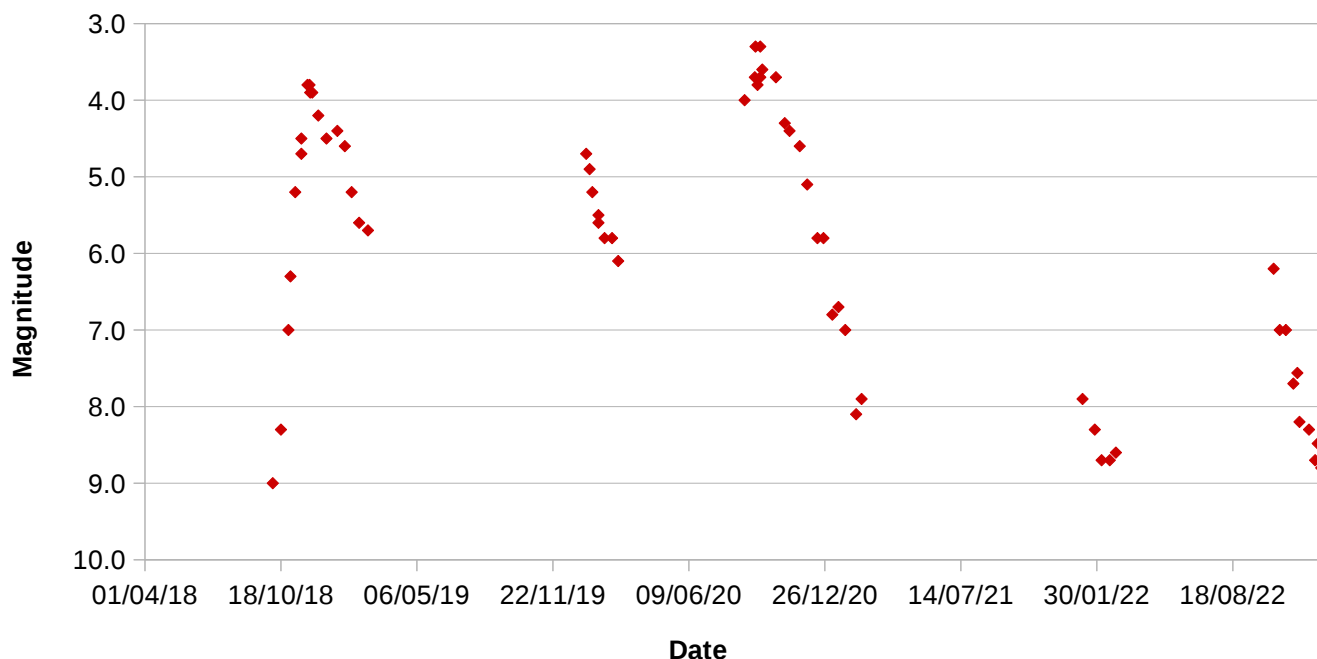
332d

Mira

Our members have observed Mira over the course of five cycles of variation, however, not all of them have been completely observed. Over the course of 2022, Mira was not observed as it rose to maximum, mostly because it was not well placed for observing, either due to being behind the Sun, or because it was only visible in the early morning. However, it was well observed as it declined in brightness. A similar problem will effect observers during 2023. Mira is predicted to reach maximum brightness during the month of June, but will reach minimum brightness during December. As Mira is best placed for observation during the autumn, it will be easier to observe Mira as its brightness declines.

Light Curve for Mira.

2018 - 2022



R Corona Borealis.

R CrB

5.8 – 15.0

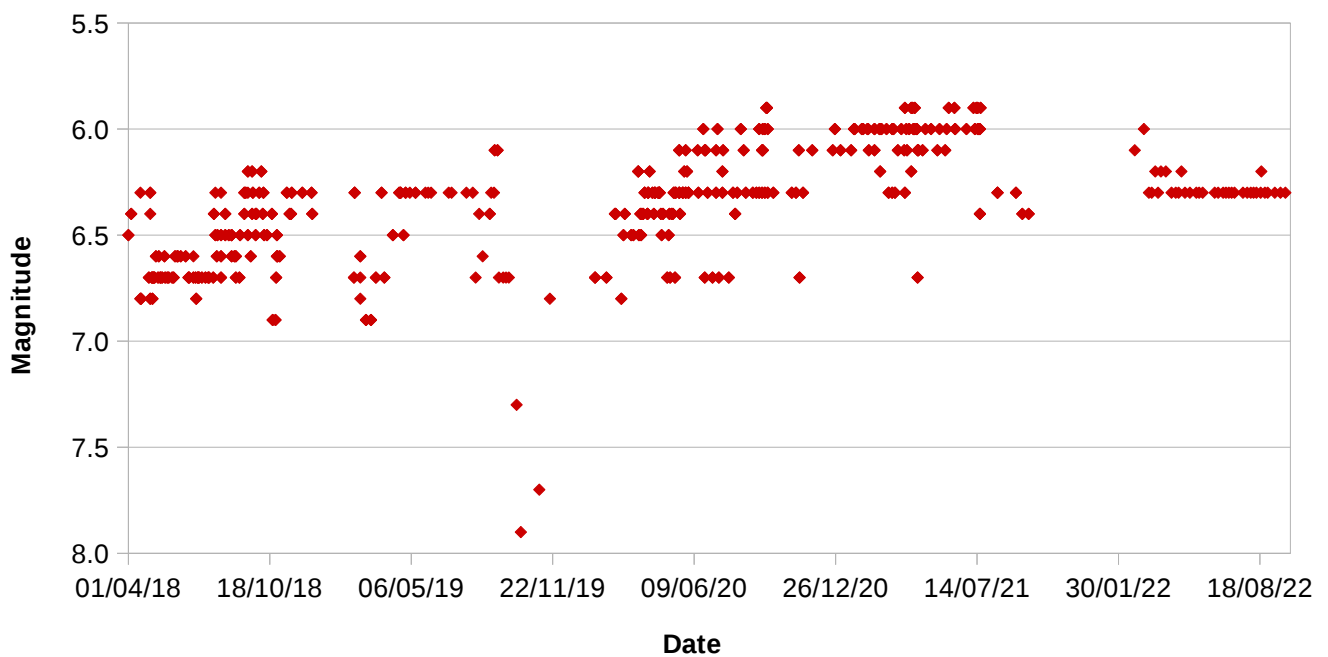
None

R CrB

R Corone Borealis didn't display any unusual behaviour during 2022. It continues to oscillate between magnitudes 6.0 and 6.5, but hasn't shown any indication of dropping in brightness. It will interesting to see what R Corone Borealis does during 2023.

Light Curve for R Cornae Borealis.

2018 - 2022



T Cephei.

T Cep

6.0 – 10.3

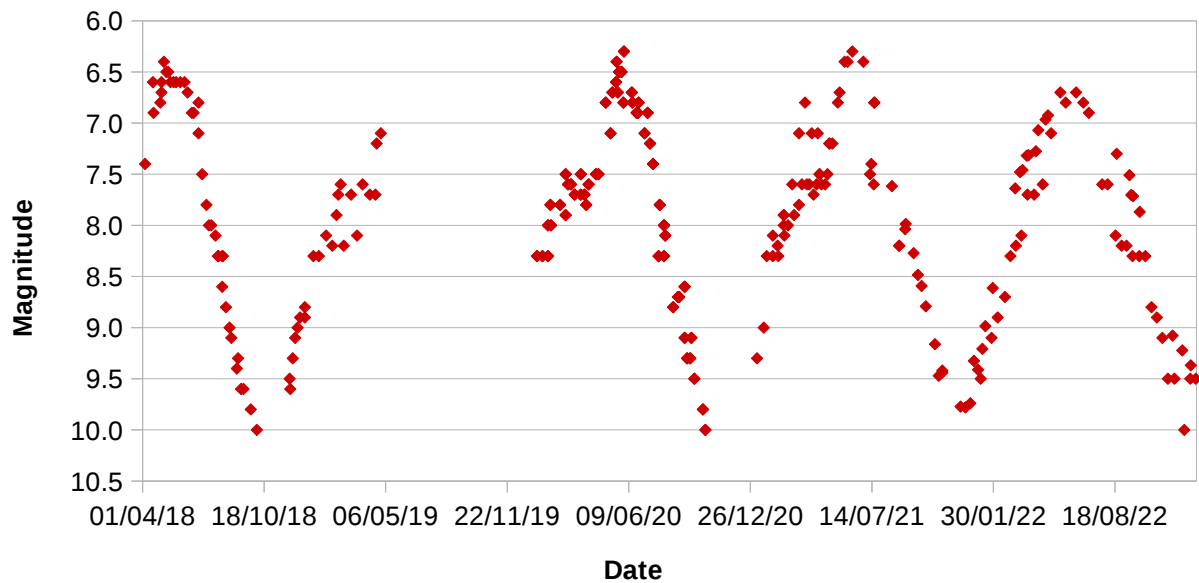
388d

Mira

Since 2018, members have observed T Cephei over the course of five cycles of variation. T Cephei is one of the most popular stars on the SPA programme. It's interesting that over the course of 2022, T Cephei a slighter brighter minimum, but a fainter maximum.

Light Curve for T Cephei.

2018 - 2022



Chi Cygni.

Chi Cyg

5.2 – 13.4

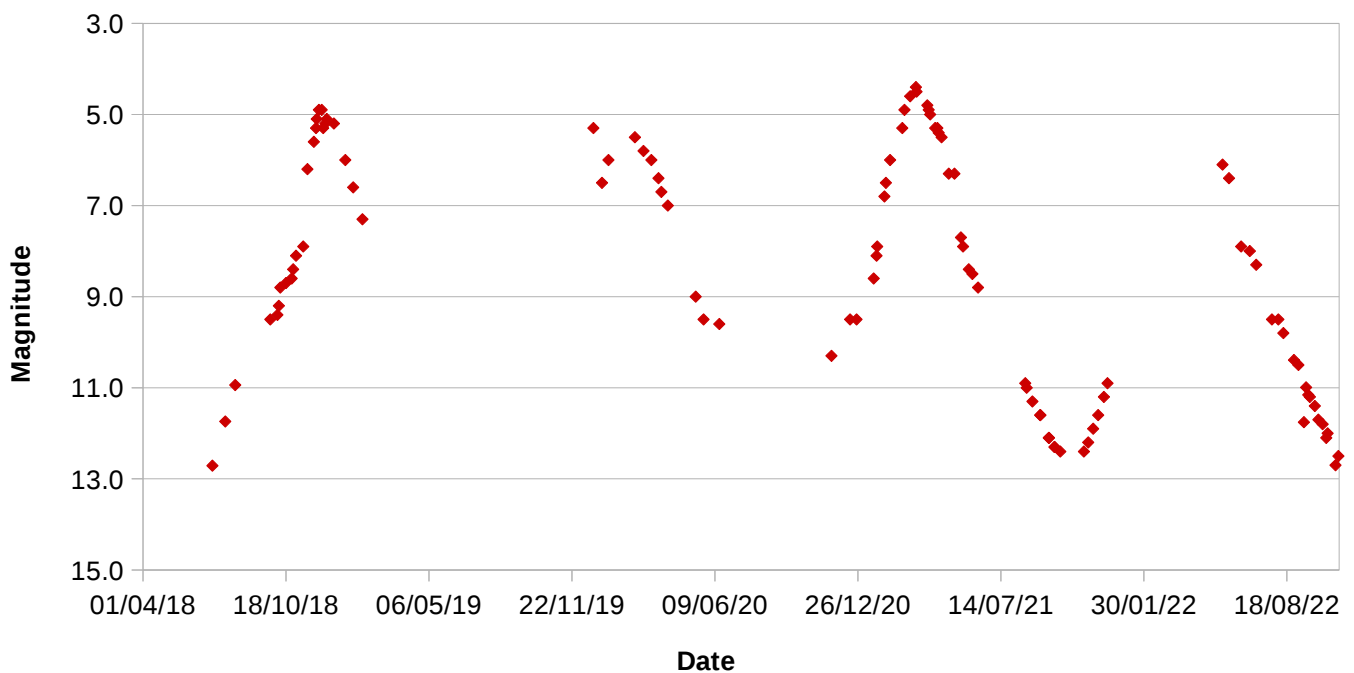
408d

Mira

Chi Cygni has been observed, by SPA members, over the course of four cycles of variations. As with Mira, Chi Cygni was not well observed as it increased in brightness during the spring, as it was only visible during the early hours. However, Chi Cygni was better observed, over the course of the summer and autumn, as it decreased in brightness.

Light Curve for Chi Cygni.

2018 - 2022



R Leonis.

R Leo

4.8 – 11.0

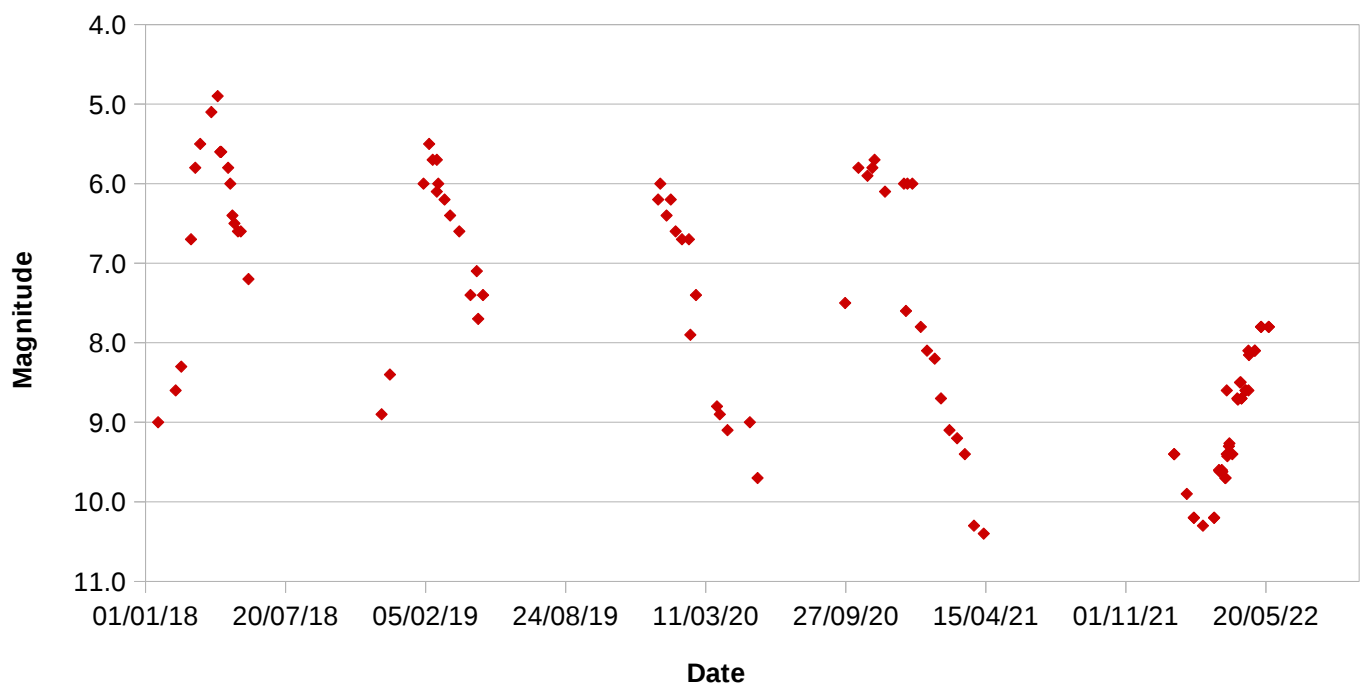
310d

Mira

R Leonis has also been observed over the course of five cycles, and although the latest cycle was not as well observed as past cycles, the trend seems to be both a deeper minimum, and a fainter maximum.

Light Curve for R Leonis.

2018 - 2022



Alpha Orionis.

Alpha Ori

0.4 – 1.3

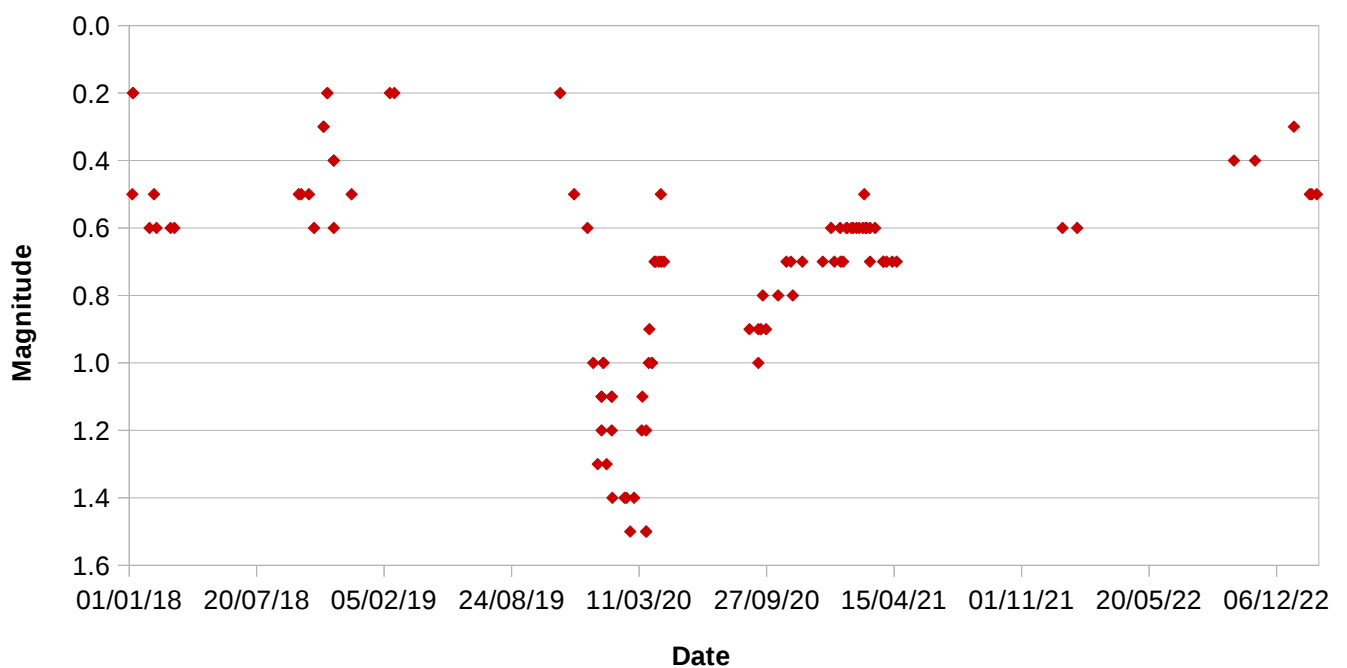
1600d

SR

After undergoing an unexpected fall in brightness, Alpha Orionis has now returned to its original brightness.

Light Curve for Alpha Orionis.

2018 - 2022



U Orionis.

U Ori

5.3 – 12.6

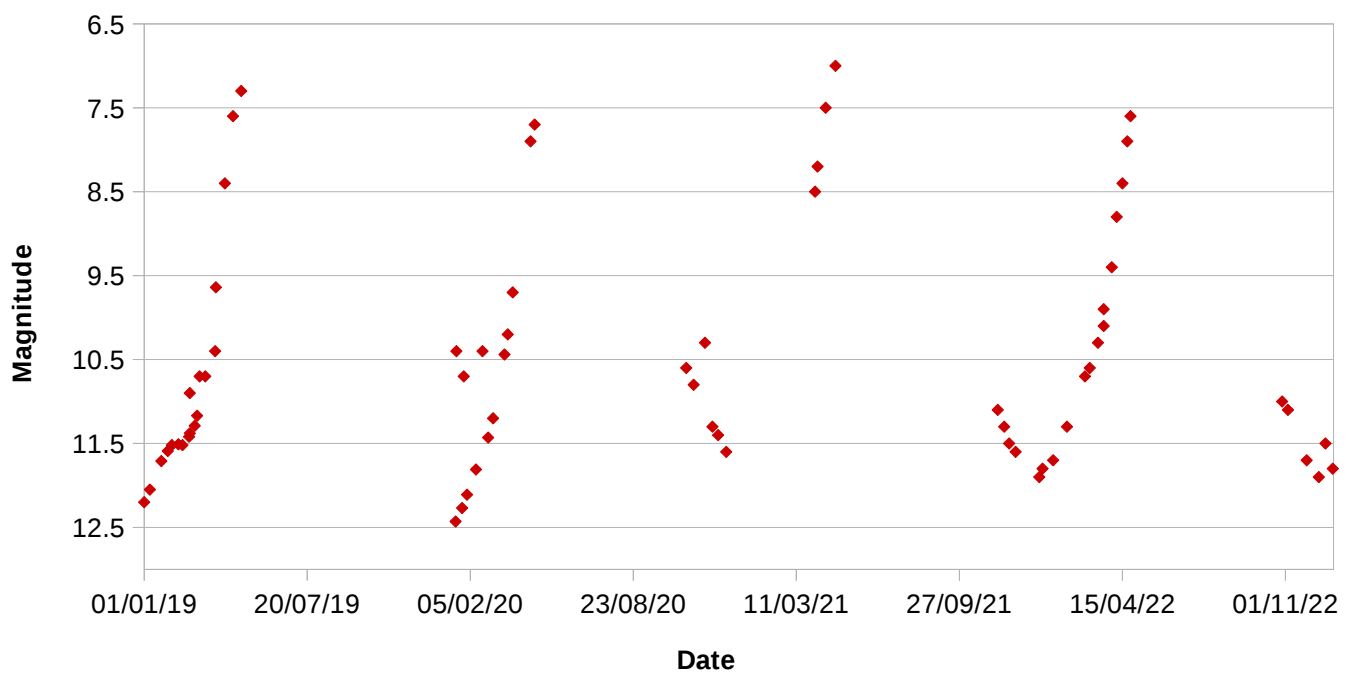
372d

Mira

U Orionis has been observed for five cycles of variation. The general trend seems to be for both the minimum and maximum brightness of U Orionis to be increasing. However, U Orionis is disappearing into the Sun's glare as it approaches maximum brightness, which is why we are not seeing the light curve's peak.

Light Curve for U Orionis.

2018 - 2022



Beta Persei (Algol).

Algol

2.1 – 3.4

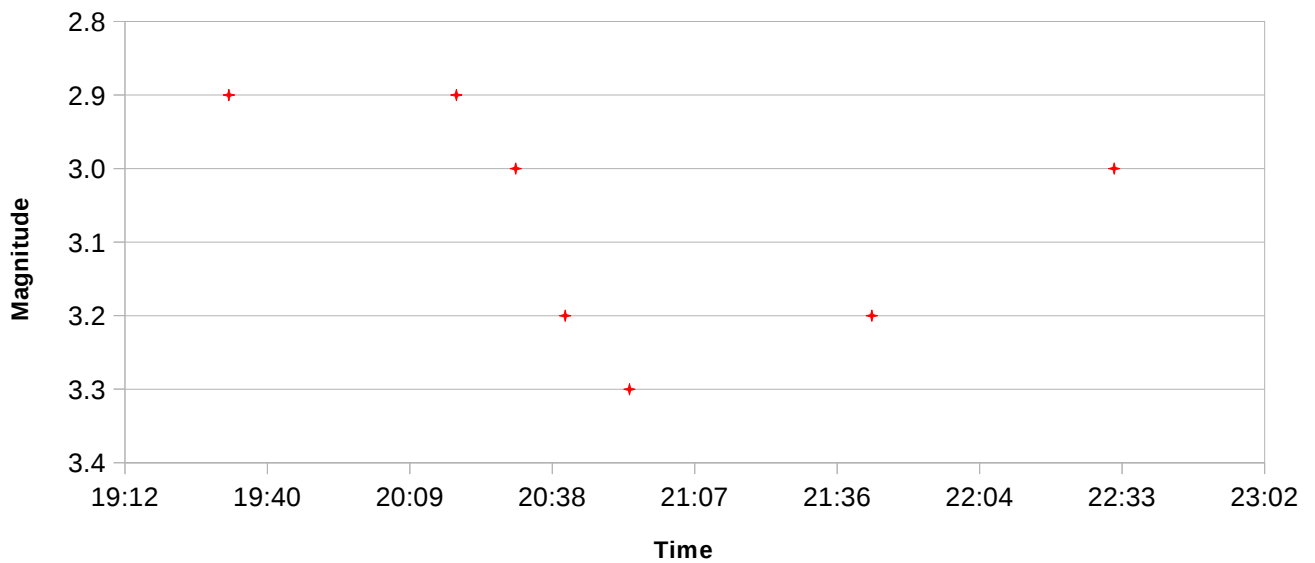
2.867d

Eclipsing

Paul Kitchen is a new variable star section member, and shared his first attempts at variable star observing. He successfully observed Algol over the course of the 19th of February 2022.

Light Curve for Beta Persei 19/02/23.

Paul Kitchen



R Scuti.

R Sct

4.5 – 8.6

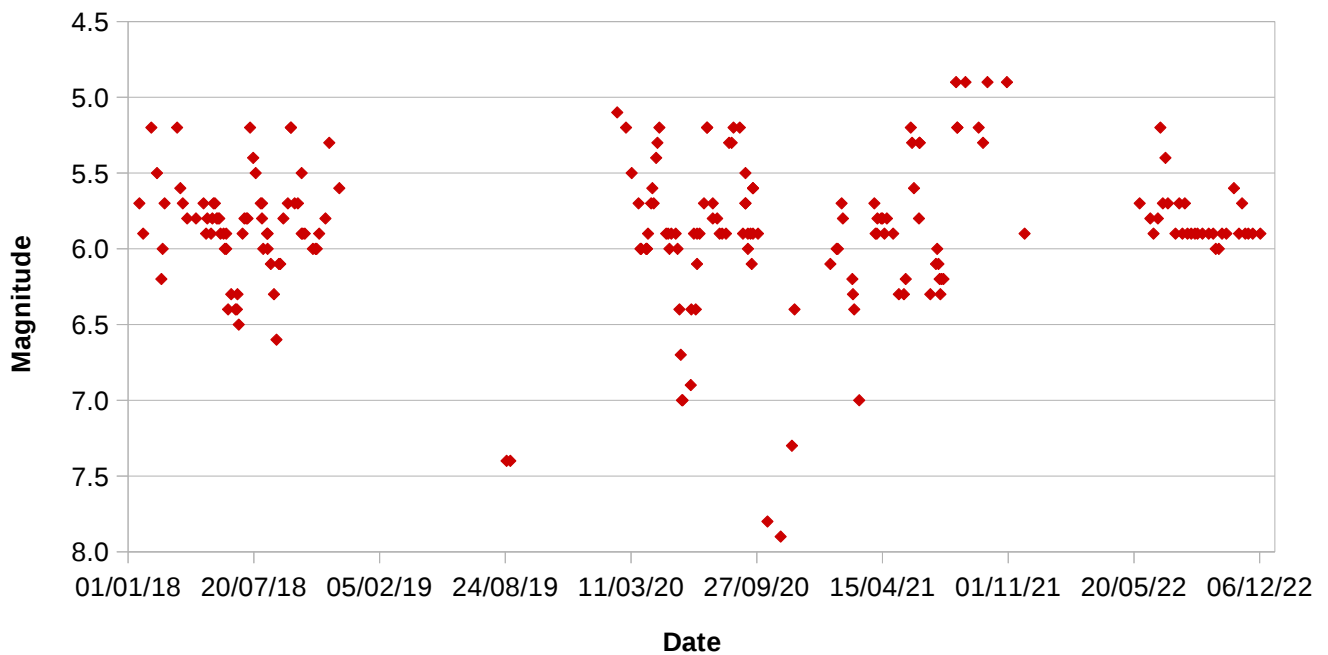
142d

R Sct

R Scuti is one of the more popular stars on the SPA programme, and recent observations show the star displaying less variation in brightness compared with past years.

Light Curve For R Scuti.

2018 - 2022



R Serpentis.

R Ser

6.8 – 13.4

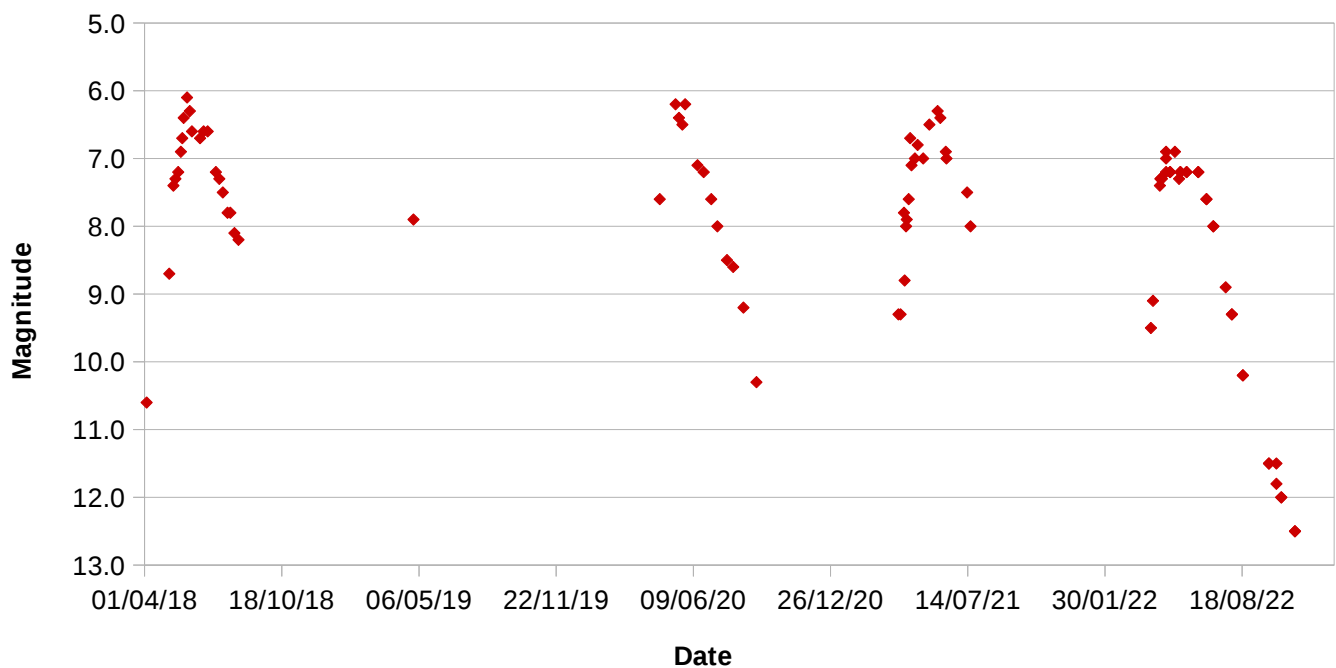
357d

Mira

We made a nice series of observations of R Serpentis over the course of 2022. We observed the star, both as it rose to brightness, and as it fell to minimum. During 2022, R Serpentis displayed a particularly deep minimum, falling well below the 12th magnitude.

Light Curve for R Serpentis.

2018 - 2022



R Trianguli.

R Tri

6.2 – 11.7

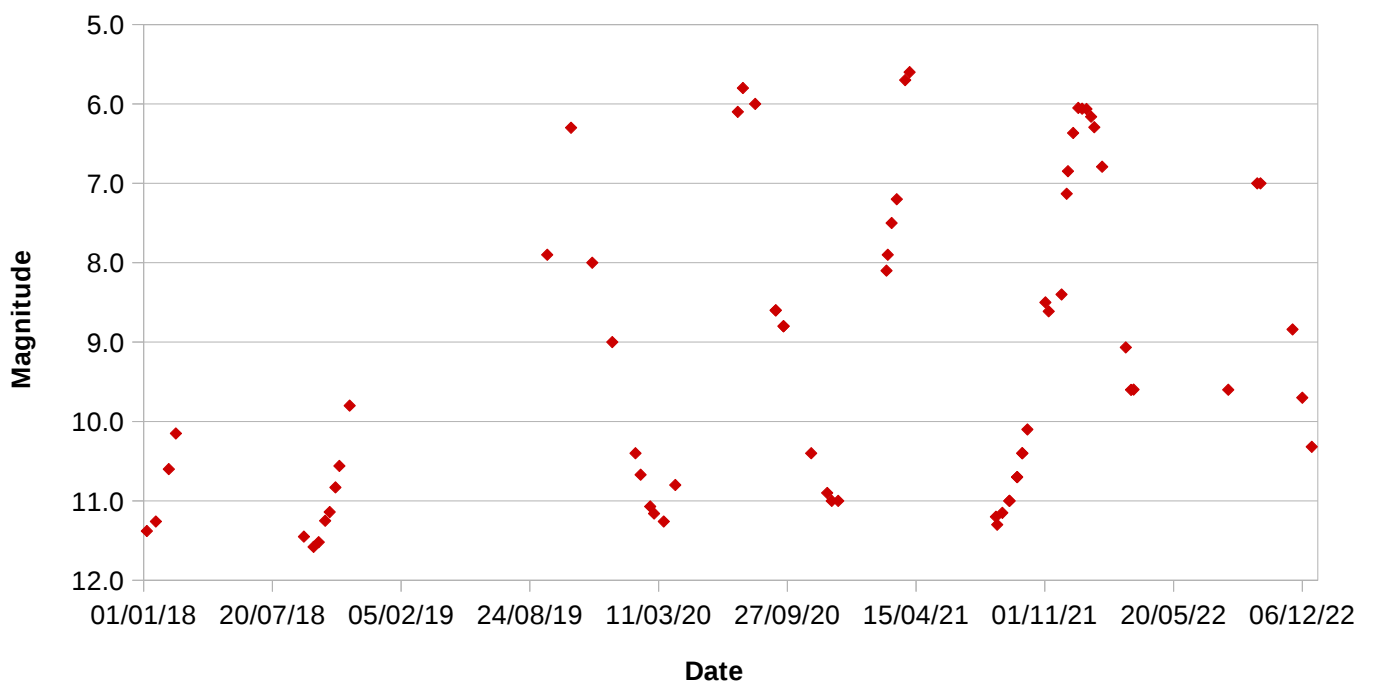
267d

Mira

We made less observations of R Trianguli, over the course of 2022, so it's hard to compare the behaviour of R Trianguli with past years. Over the past few years, R Trianguli seems to be fairly regular in its range, so it'll be interesting to see how R Trianguli will vary over the course of 2022 – 2023.

Light Curve for R Trianguli.

2018 - 2022

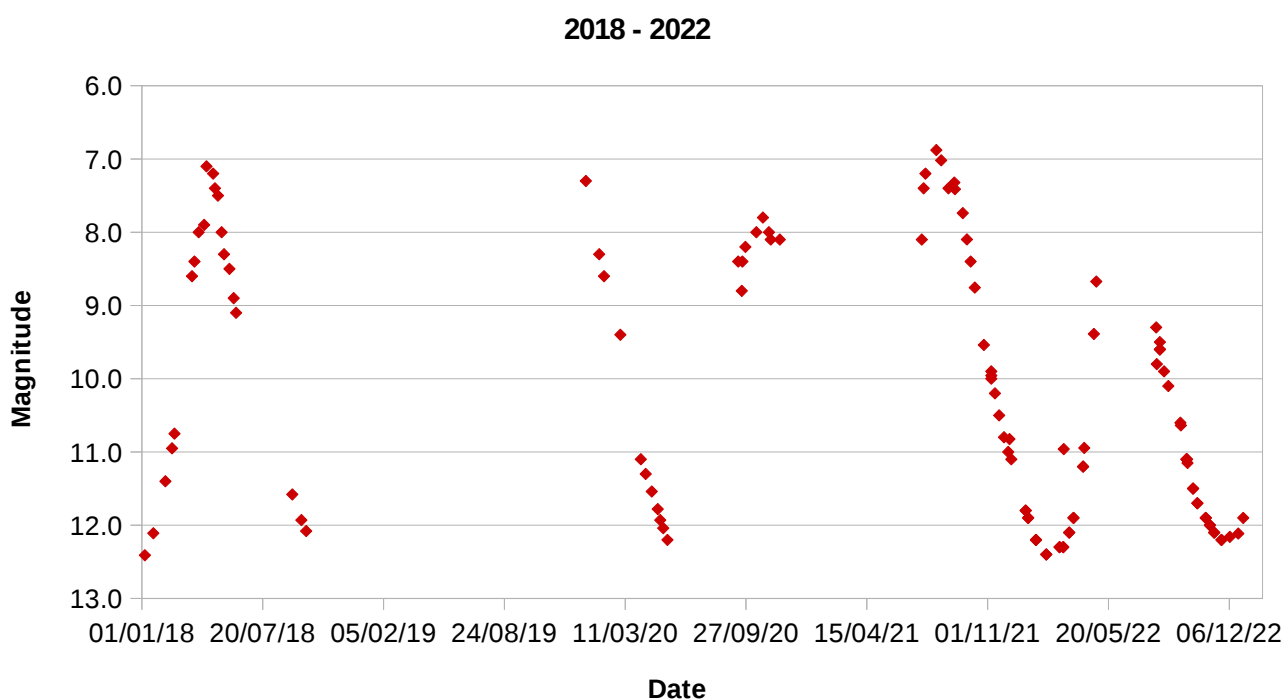


R Ursa Majoris S Ursa Majoris and T Majoris.

R UMa	7.5 – 13.0	302d	Mira
S UMa	7.8 – 11.7	226d	Mira
T UMa	7.7 – 12.9	257d	Mira

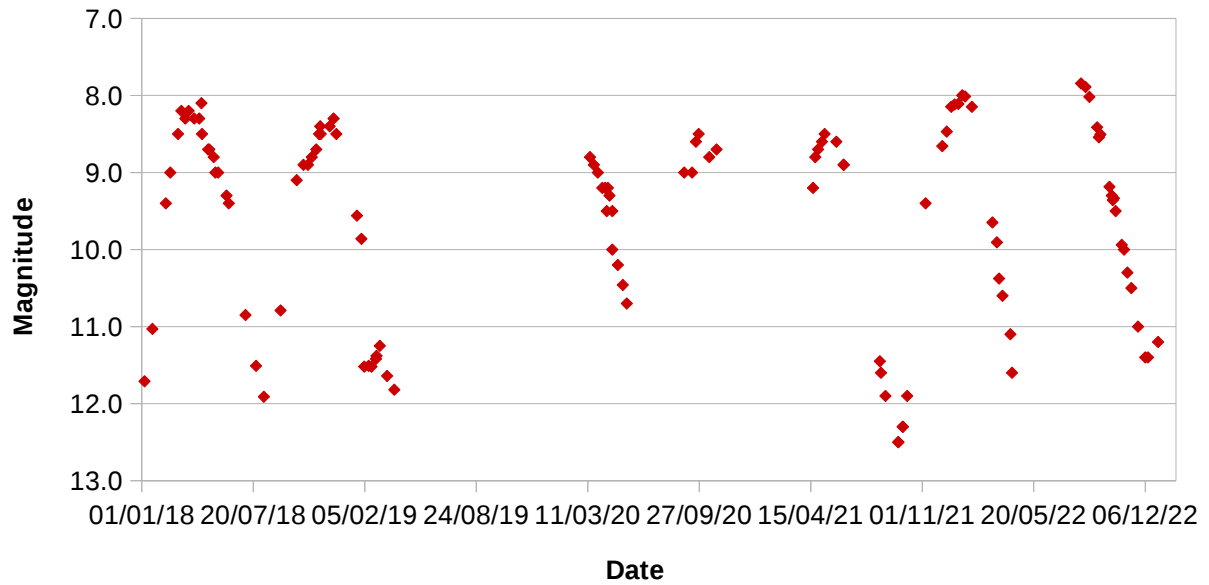
R Ursa Majoris, S Ursa Maoris and T Majoris are all popular stars to observe. We missed the maximum of T Ursa Maoris, during 2022, possibly because of bright summer evenings, however, we did obtain a complete series of observations of R Ursa Majoris as it fell to minimum. R Ursae Majoris seemed to have reached a brighter minimum compared to past years. Likewise, we didn't manage to observe S Ursa Majoris as it rose to brightness, but once it passed maximum, a large number of observations were made. S Ursa Majoris seems to have obtained, both a brighter maximum brightness, and a brighter minimum, compared to past years.

Light Curve for R Ursae Majoris.



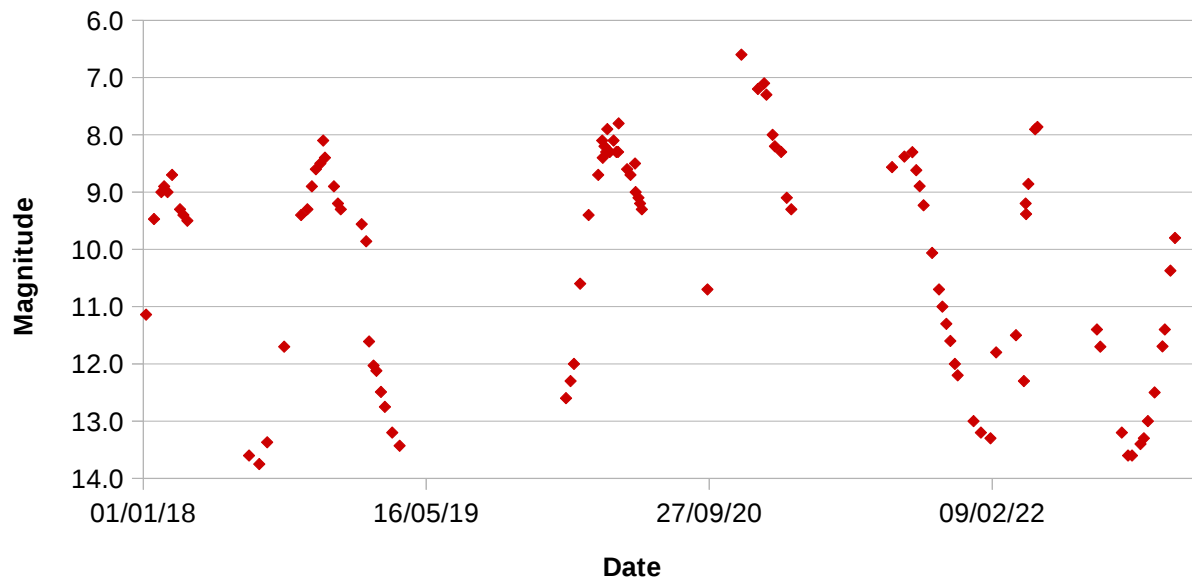
Light Curve for S Ursae Majoris.

2018 - 2022



Light Curve for T Ursae Majoris.

2018 - 2022



Z Ursa Majoris.

Z UMa

6.3 – 9.6

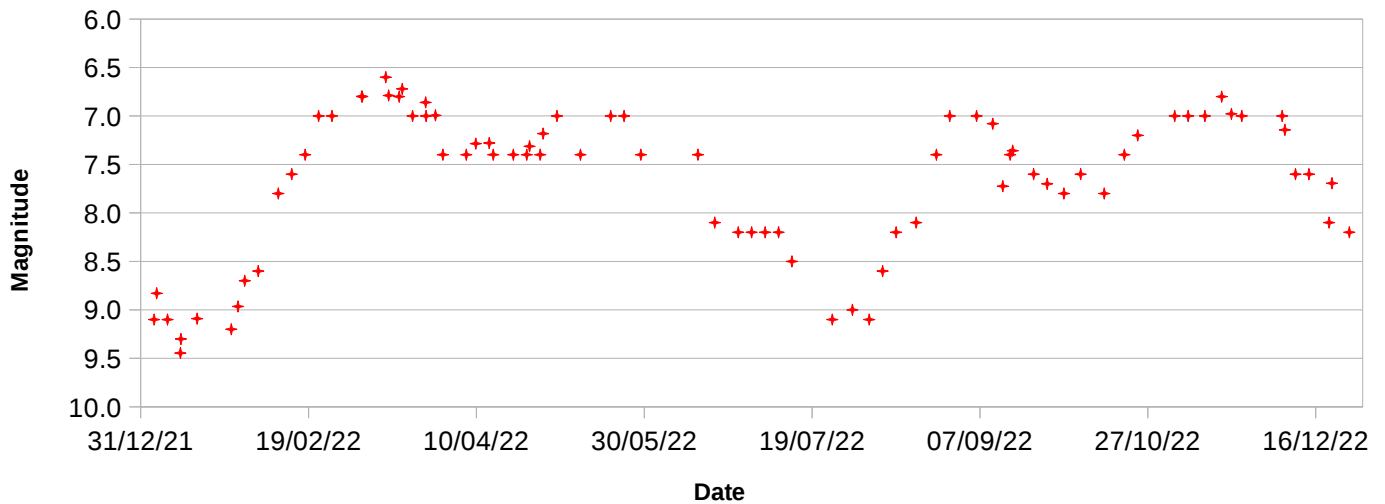
195d

SR

Z Ursa Majoris is another popular star, and over the past few years, we have made a large number of observations. We made so many observations over the course of 2022, that we were able to create a very detailed light curve. We followed Z Ursa Majoris over the course of two cycles of variation. Each cycle consisted of a deep minimum and a shallow minimum. The deep minimums saw the star fall to between 9.0 and 9.5, whereas the shallower minimum sees the star fall to between magnitudes 7.0 and 8.0. The deep and shallow minimum are separated by a hump, which during the first cycle of variation was less then the primary maximum, and during the second cycle of variation, was as bright as the primary maximum. The secondary maximum also seems to be broader then the primary maximum, which is more of a peak.

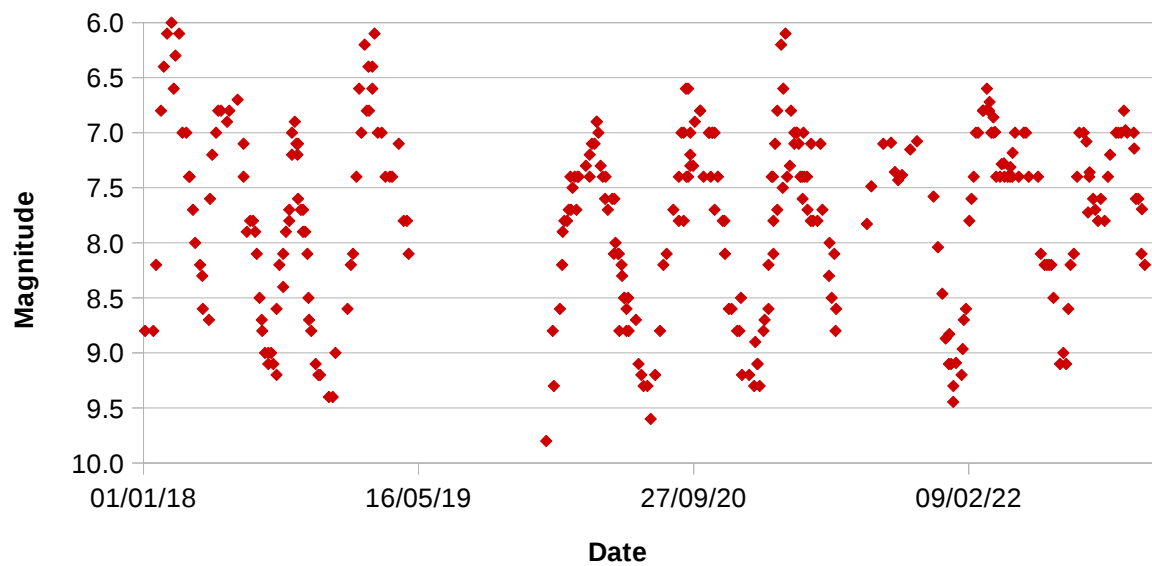
Light Curve for Z Ursae Majoris.

Based on SPA Member's Observations 2022



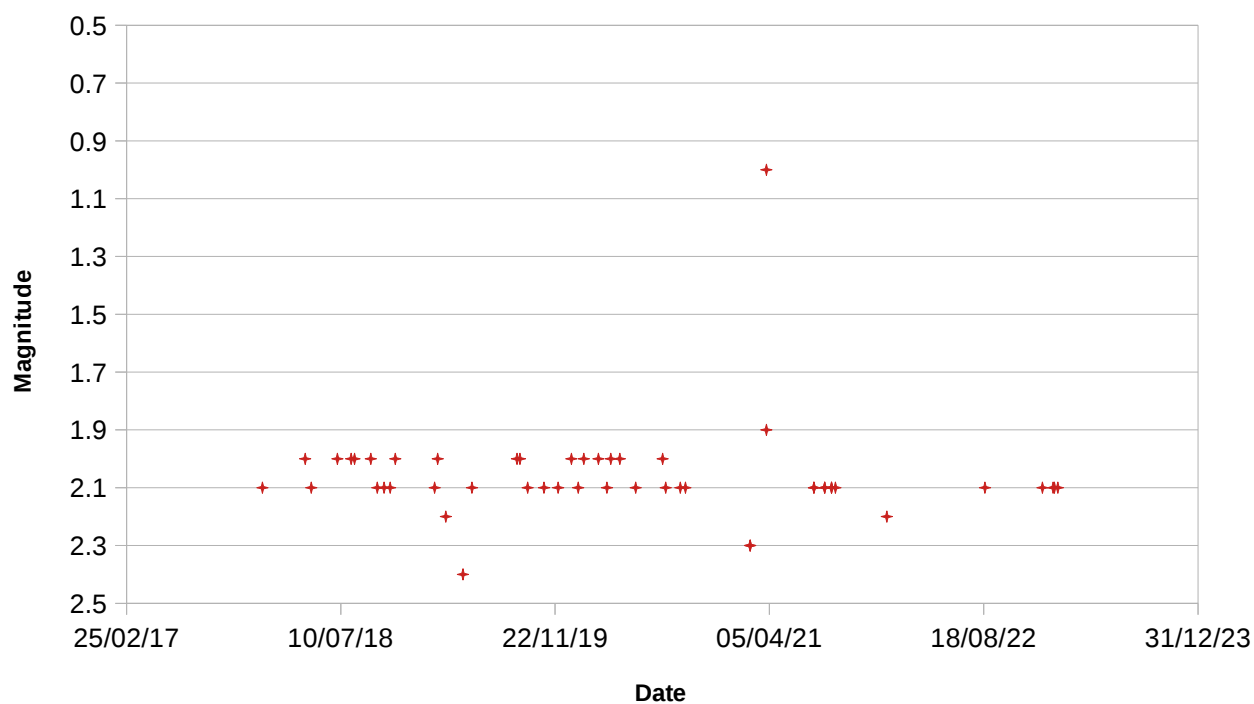
Light Curve for Z Ursae Majoris.

2018 - 2022



Gamma Cas

2018 - 2022

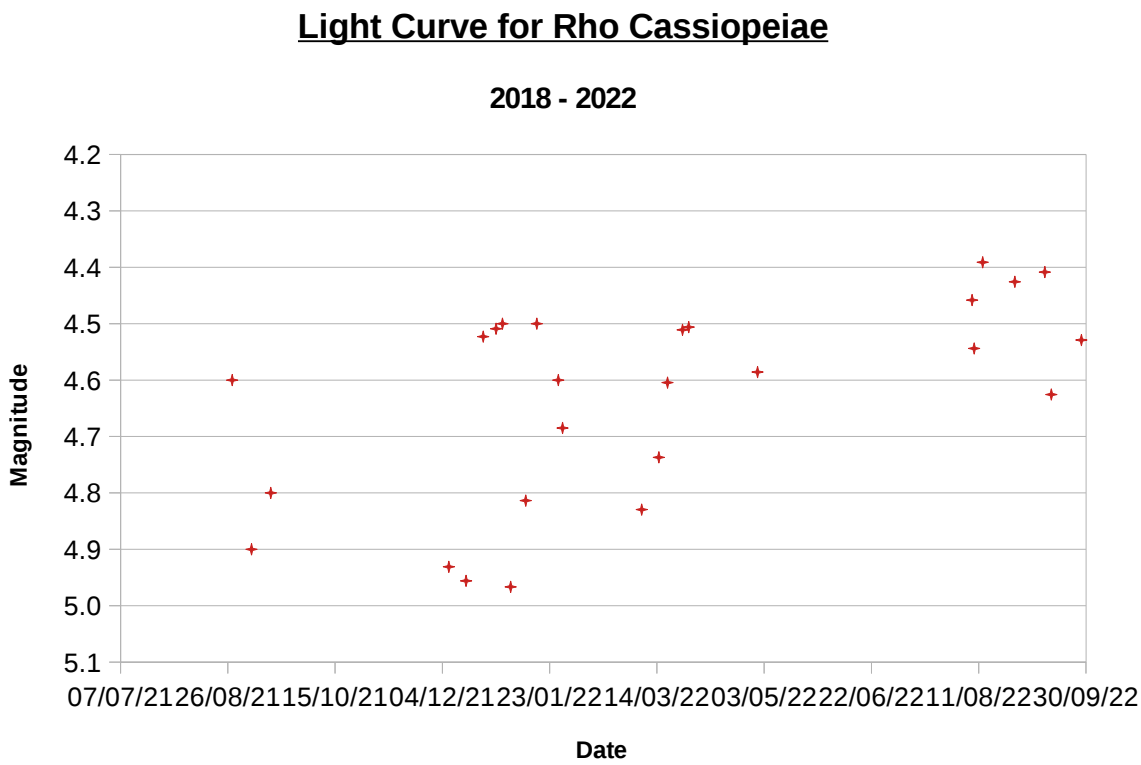


Rho Cas

4.2 – 6.2

None

SDOR



AF Cyg

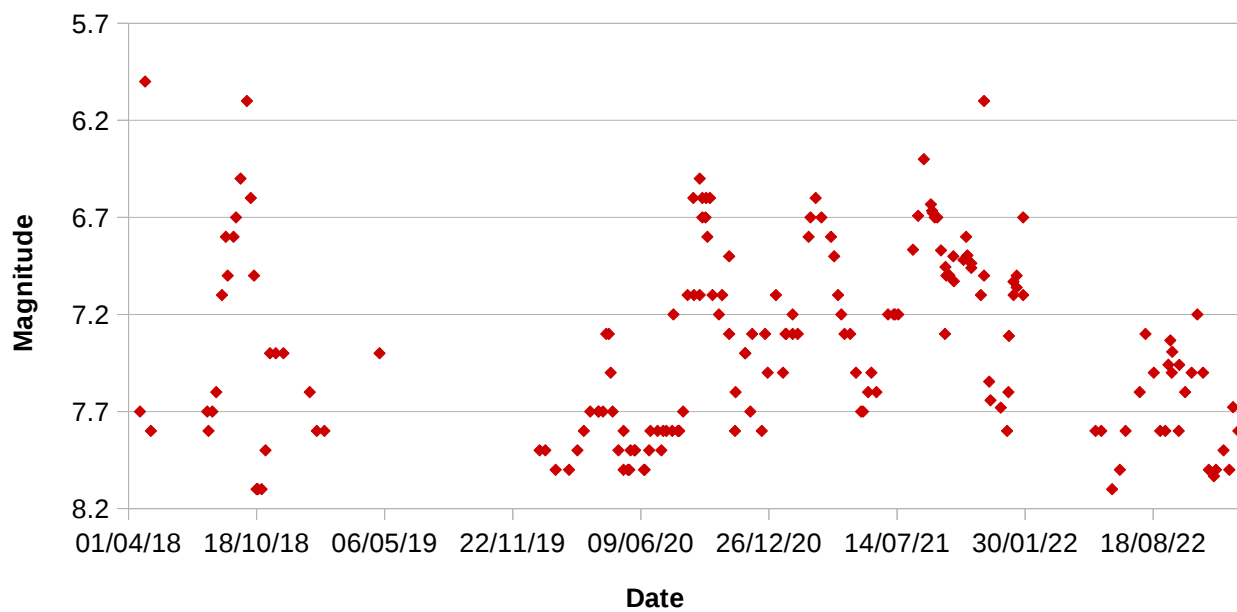
6.4 – 8.4

92d

SR

Light Curve for AF Cygni.

2018 - 2022



RY Dra

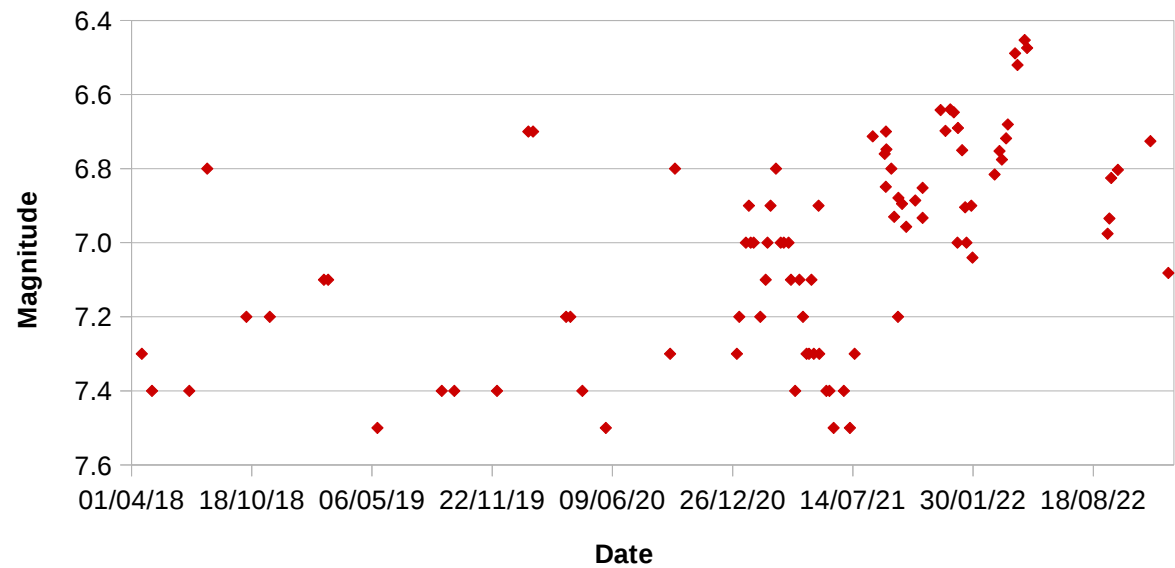
6.0 – 8.0

200d

SR

Light Curve for RY Draconis.

2018 - 2022



Beta Lyr

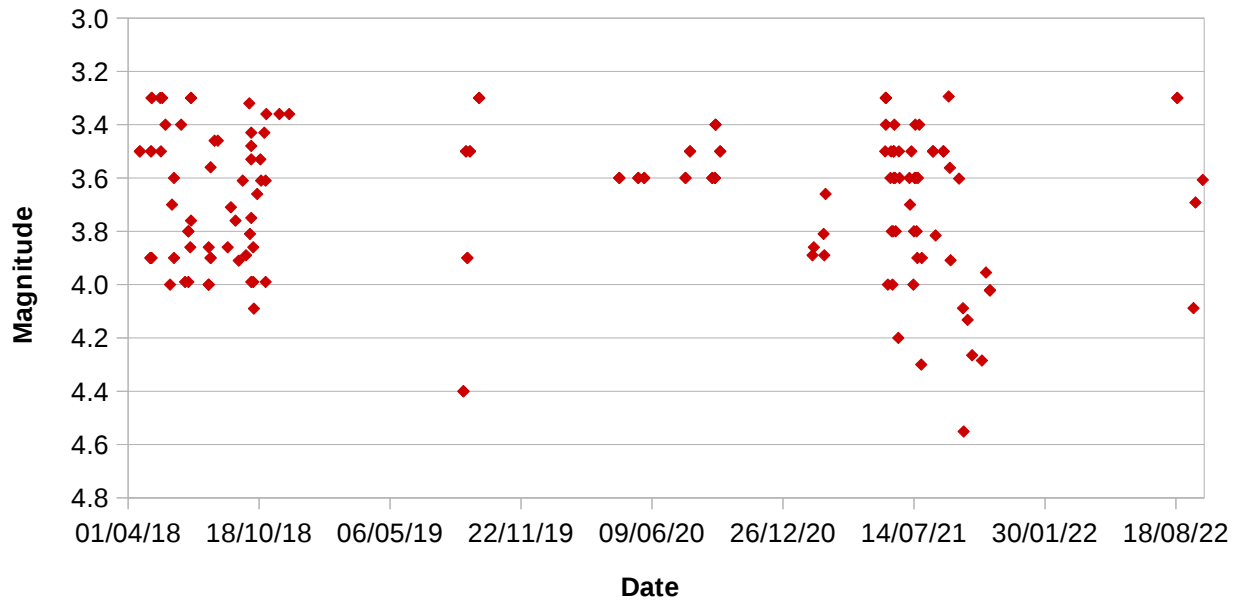
3.4 – 4.3

12.941

EB

Light Curve for Beta Lyrae.

2018 - 2022



Delta Cep

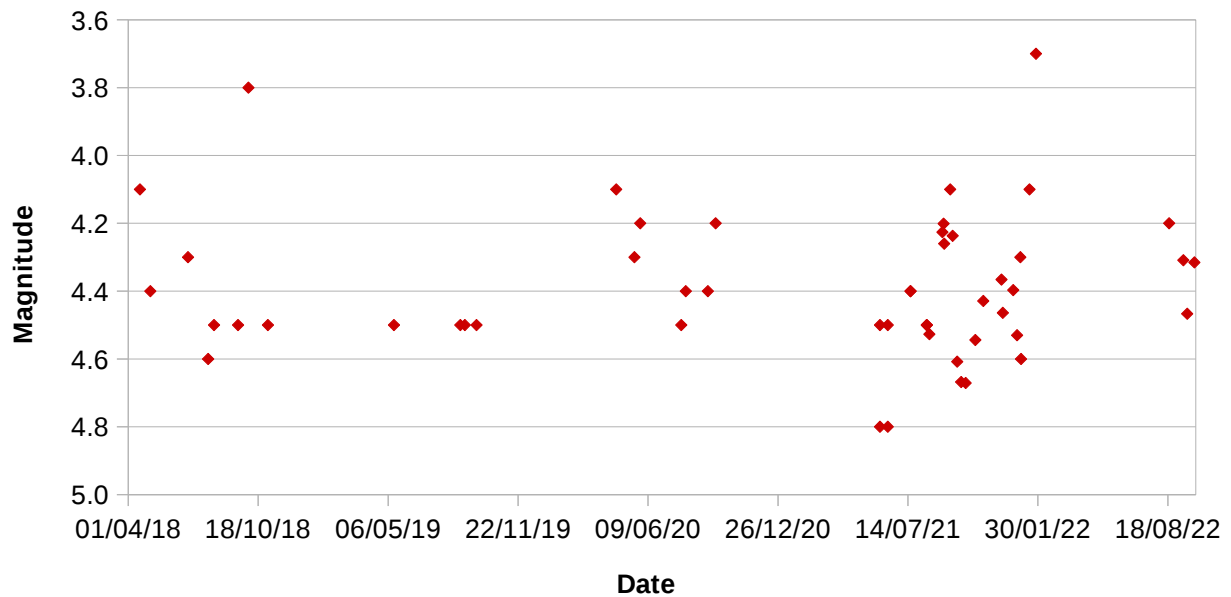
3.4 – 4.3

5.366

Cep

Light Curve for Delta Cephei.

2018 - 2022



Steve Harrison sent us some spectroscopic observations of Gamma Cassiopeia, RZ Cassiopeia and Mira. The spectrum are below:

