Hunting Outbursting Young Stars

with the

Centre of Astrophysics and Planetary Sciences (HOYS-CAPS)

at the

University of Kent

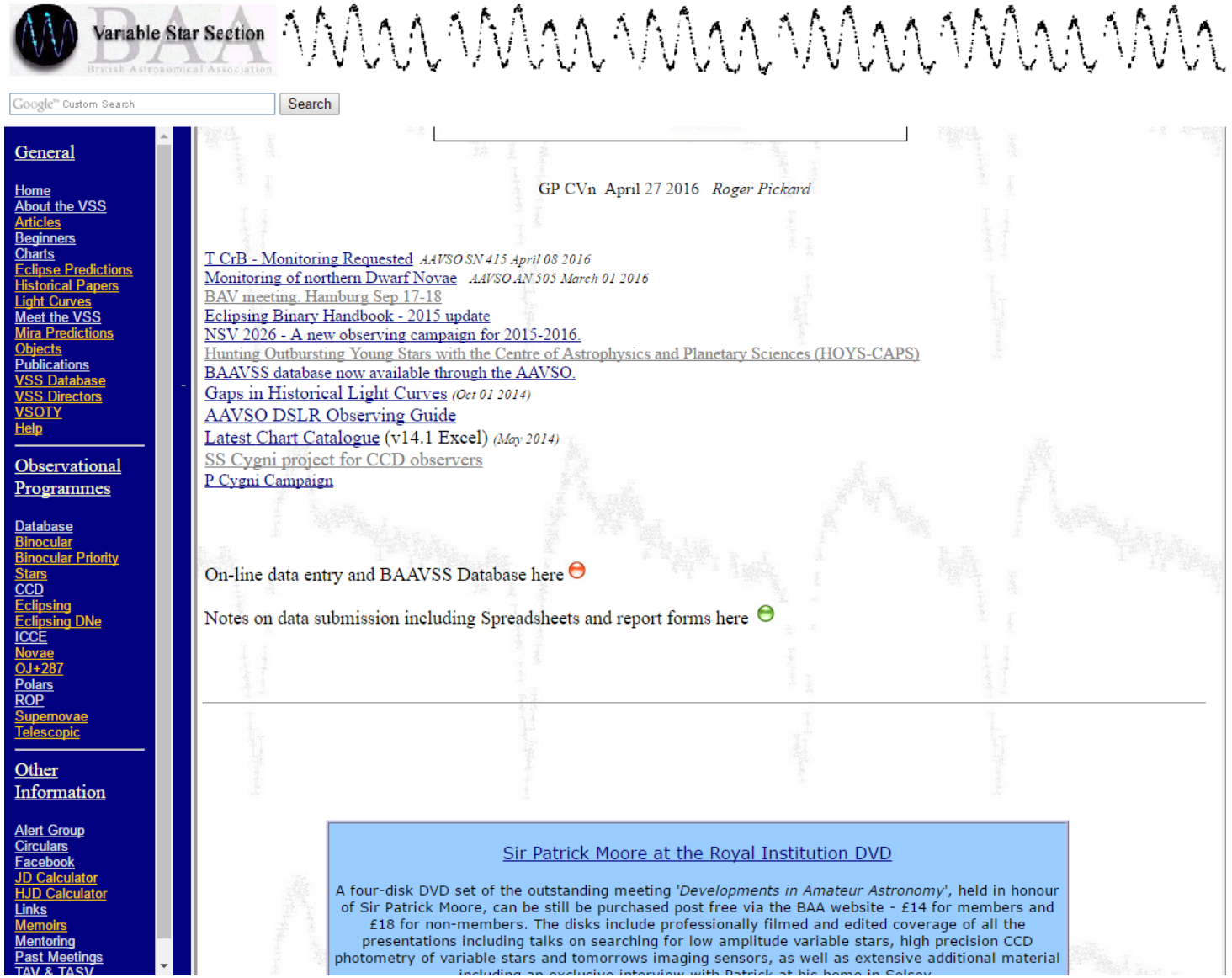
How did this HOYS-CAPS Programme come about?

From a BAA Meeting entitled **'Amateur & Professional Collaboration'**
held in , Ashford, Kent, on Saturday, 2015, April 25

Programme:

10:00 Registration – Tea / Coffee & time to visit our retailers
10:20 Official welcome & BAA business – BAA President, Mrs Hazel McGee
10:30 **Dr Dirk Froebrich – "Hunting for Eruptive Young Stellar Objects"**
11:30 Mr Roger Pickard – "More Pro-Am Projects"
12:30 Mr Drew Wagar – AAS Chairman "The past, present, future of the Ashford Astronomy Society"
13:00 Lunch & time to visit our retailers and do some solar observing (weather permitting)
14:30 Dr Anthony Cook – Lunar Citizen Science
15:05 Prof Bill Leatherbarrow - "An introduction to Quick Map: a resource for lunar observers"
15:20 Mr Barry FitzGerald – "Amateur Astrogeology using LRO and other digital resources"
16:00 Tea & time to visit our retailers
16:30 Miss Alice Sheppard – "When the Universe came to the people"
17:40 Close

Scroll down:-



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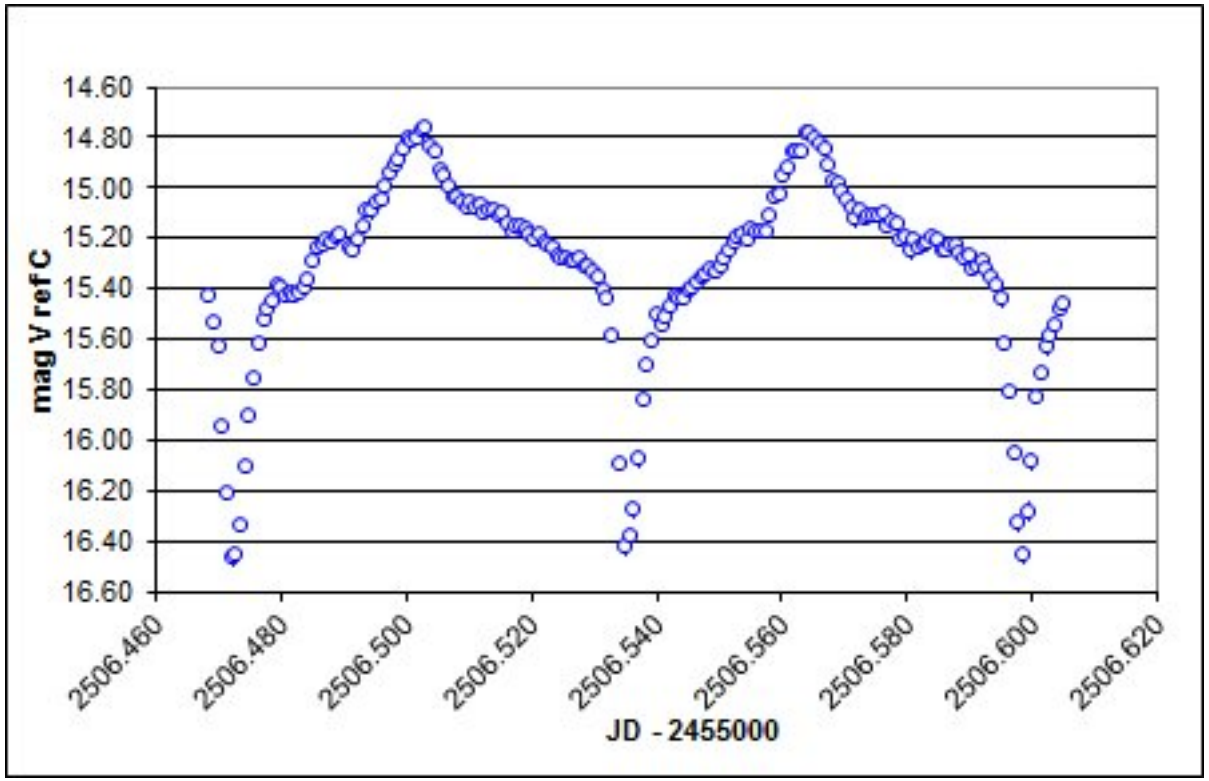
But you can't do this visually!

It has to be done either with a CCD or a DSLR camera

CCD Photometry

Most of the CCD Photometry that I do has to be carefully "reduced" to get a meaningful result.

This means using powerful software, in my case, called **"Astronomical Image Processing for Windows"** or **AIP4WIN** for short.

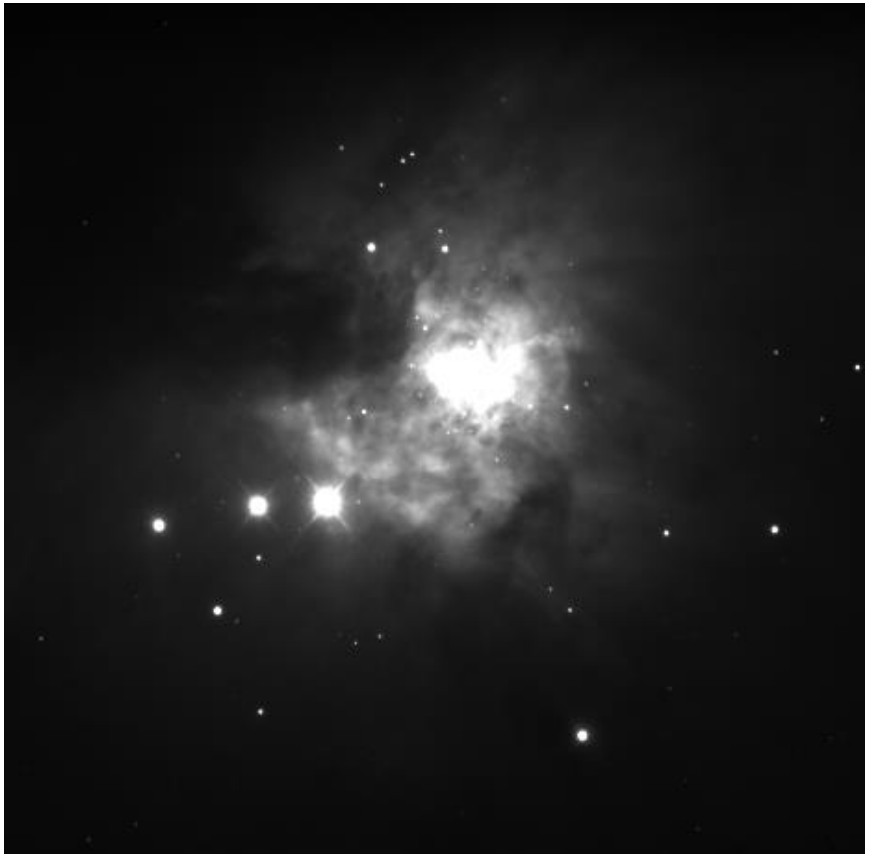


GP CVn 2016 April 27/28

CCD Photometry

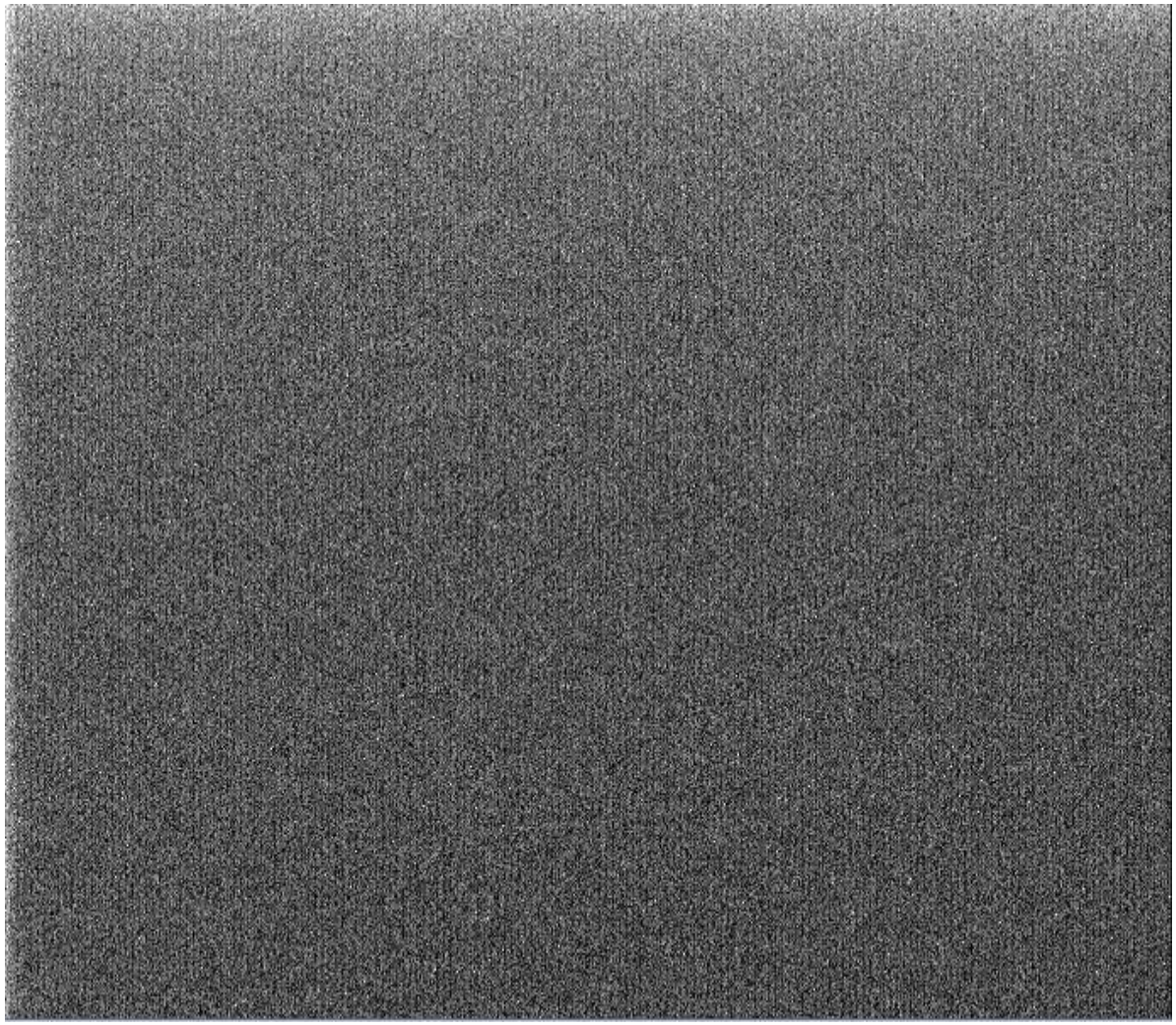
However, if I'm taking images of these HOYS-CAPS stars I don't have to do that and so it's much easier.

All that is necessary is to do the usual dark frame and flat field subtraction.



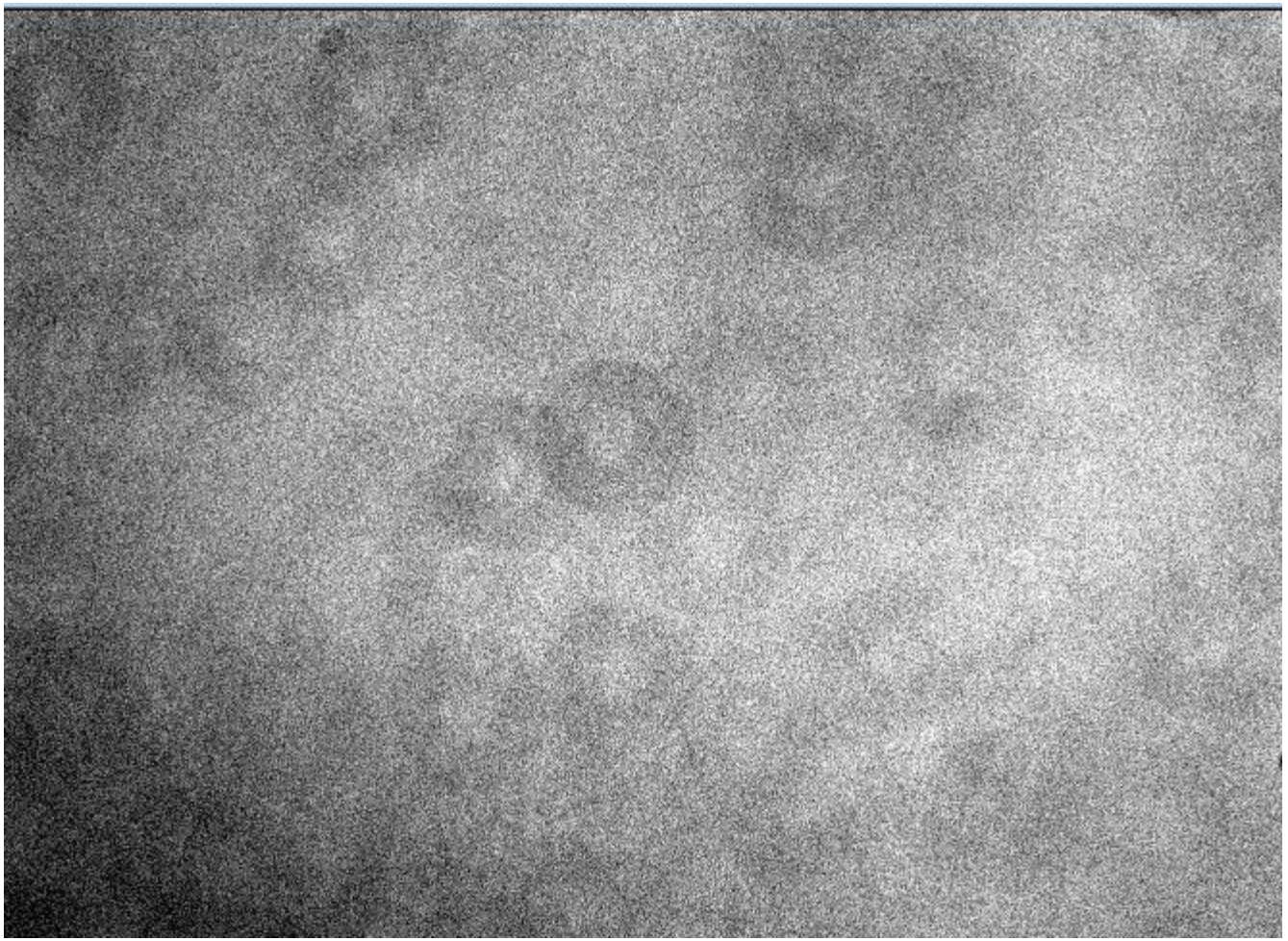
CCD Photometry

The dark frame.



CCD Photometry

The flat field.



DSLR Photometry

Much the same is true with a DSLR camera

Except it's easier with a DSLR camera.

You also get a larger image covering a much larger area of sky, hence with more stars in it.

You then send them to Dirk and he does the rest!

More DSLR Photometry

The AAVSO DSLR Observing Manual

Target audience

Anyone with an interest in using DSLR cameras to measure the brightness of variable stars

Most of the book is written with the first time observer in mind

Plus high-level details for the more advanced

Download it for free!
http://www.aavso.org/sites/default/files/AAVSO_DSLR_Observing_Manual_v1-2.pdf

The AAVSO DSLR Observing Guide

Variable Star Section

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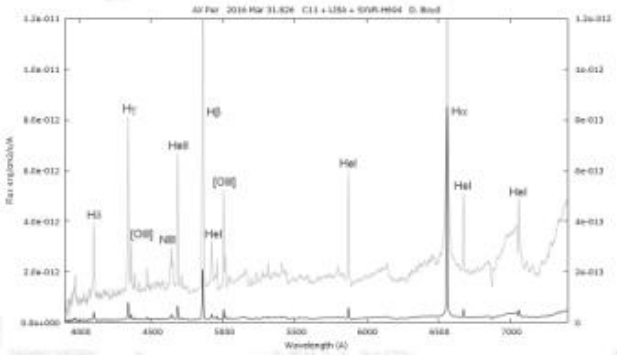


AX Per 2016 Mar 31.826 C11+LISA+SXVR-H694 *David Boyd*

T CrB - Monitoring Requested *AAVSO SN 415 April 08 2016*
Monitoring of northern Dwarf Novae *AAVSO AN 505 March 01 2016*
BAV meeting, Hamburg Sep 17-18
Eclipsing Binary Handbook - 2015 update
NSV 2026 - A new observing campaign for 2015-2016.
Hunting Outbursting Young Stars with the Centre of Astrophysics and Planetary Sciences (HOYS-CAPS)
BAAVSS database now available through the AAVSO.
Gaps in Historical Light Curves *(Oct 01 2014)*
AAVSO DSLR Observing Guide
Latest Chart Catalogue (v14.1 Excel) *(May 2014)*
SS Cygni project for CCD observers
P Cygni Campaign

On-line data entry and BAAVSS Database here

Notes on data submission including Spreadsheets and report forms here

But back to the main HOYS-CAPS Programme

Winter Target List:

Number	Cluster/Region Name	RA (J2000)	DEC (J2000)	Notes
001	**NGC 1333**	03 29 02	+31 20 54	
002	**IC 348**	03 44 34	+32 09 48	
006	**Lambda - Ori Cluster**	05 35 06	+09 56 00	
003	**M42**	05 35 17	-05 23 28	Orion Nebula
007	**L 1641 N Cluster**	05 36 19	-06 22 12	
005	**Sigma - Ori Cluster**	05 38 45	-02 36 00	
009	**NGC 2068**	05 46 46	+00 04 12	
008	**NGC 2244**	06 31 55	+04 56 30	Rosette Nebula
004	**NGC 2264**	06 40 58	+09 53 42	Christmas Tree Cluster

But back to the main HOYS-CAPS Programme

Summer Target List:

Number	Cluster/Region Name	RA (J2000)	DEC (J2000)	Notes
101	**Cygnus X**	Anywhere from 74deg to 86deg Galactic Longitute and -3deg to +5deg Galactic Latitude (there are many young clusters in this area)		
112	**MWSC 3274**	20 11 13	+37 27 00	within the Cygnus X region
111	**MWSC 3301**	20 17 47	+38 01 59	P Cyg Cluster, within the Cygnus X region
110	**Berkeley 86**	20 20 12	+38 41 24	within the Cygnus X region
118	**IC 5070**	20 51 00	+44 22 00	Pelican Nebula
117	**NGC 7000**	20 58 47	+44 19 48	**Large 2.5deg field** around North America Nebula
115	**IC 1396 A**	21 36 35	+57 30 36	Elephant Trunk Nebula in IC 1396
113	**IC 1396**	21 39 00	+57 29 24	**Large 2.5deg field** around central star
114	**IC 1396 N**	21 40 42	+58 16 06	in IC 1396
116	**NGC 7129**	21 42 56	+66 06 12	
119	**IC 5146**	21 53 29	+47 16 01	Cocoon Nebula

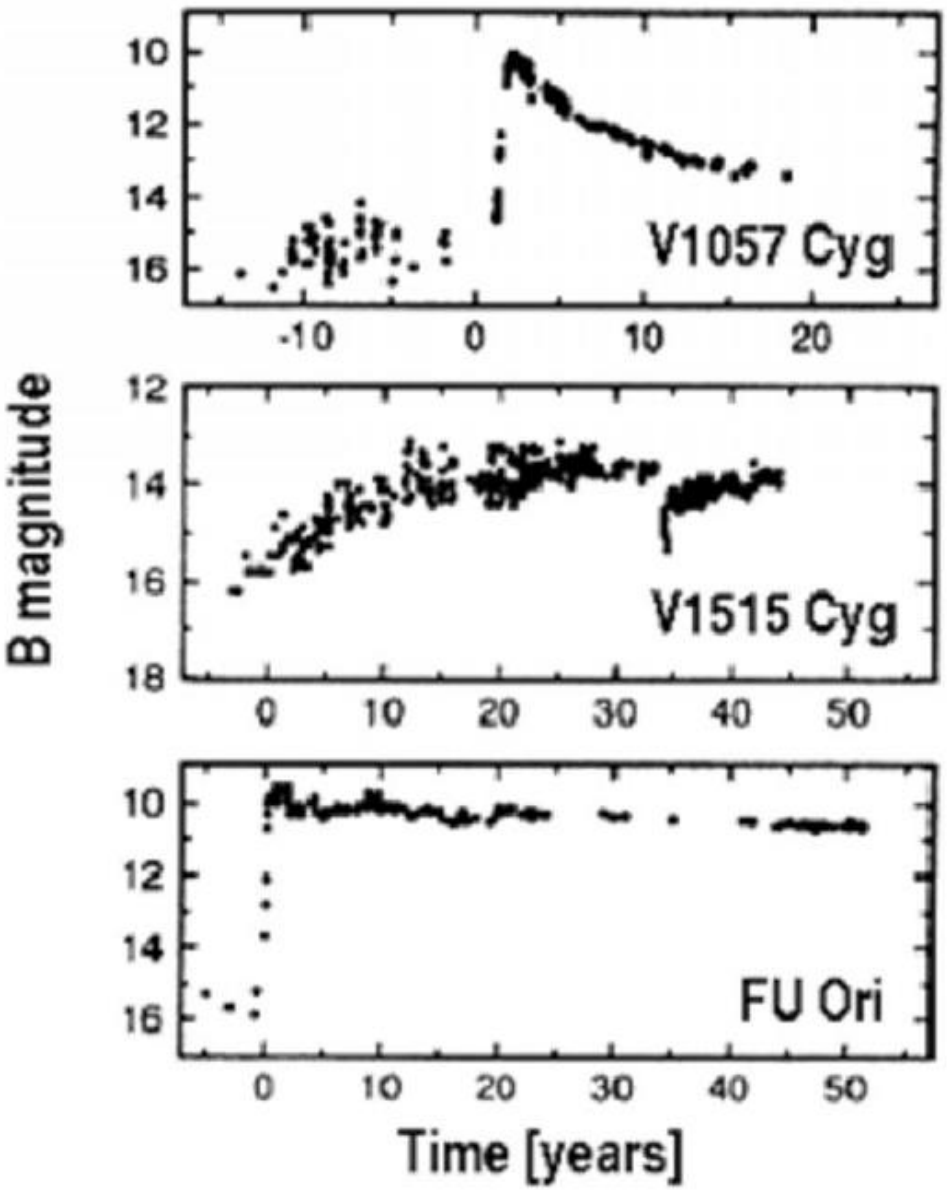
Hunting for Eruptive Young Stellar Objects

Dirk Froebrich

CENTRE FOR ASTROPHYSICS AND PLANETARY SCIENCE (CAPS)
University of Kent

National Optical Astronomy Observatory: NGC 7129

YSO variability/outbursts



Getting started

Targets:

To start off, limited to a small number of target clusters.

Four young clusters visible in winter.

One large star forming area for the summer.

Centre your images as close as possible on the provided coordinates.

More clusters in the future.

Observing Strategy:

Any image is useful and much appreciated.

The field of view, filter used and integration times do not matter.

Concentrate efforts on a small number of targets but with longer exposures.

Images can be taken at any time, ideally one every few weeks, but even a single image is helpful.

Observing Strategy:

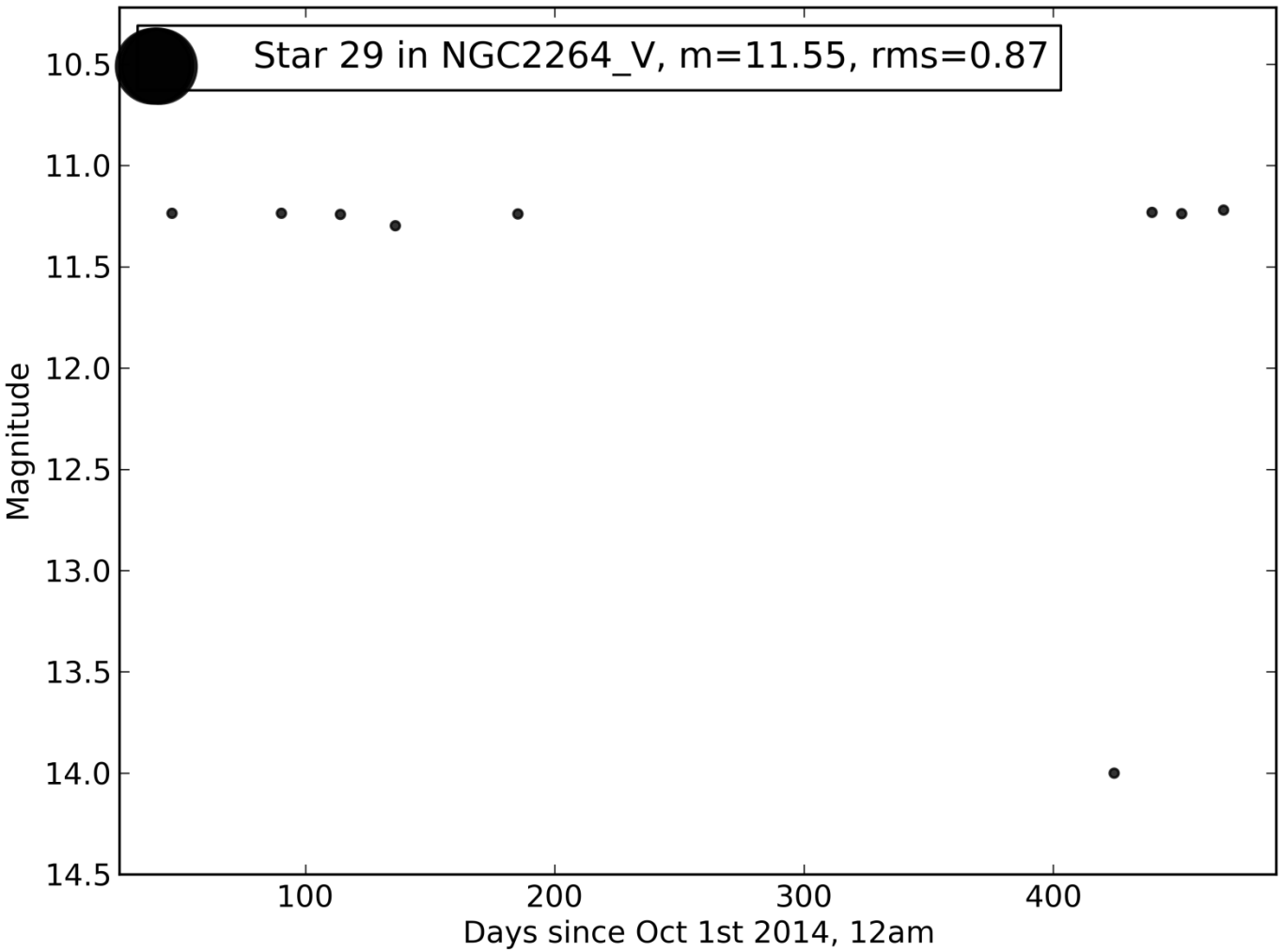
Aim is to find highly variable or outbursting objects

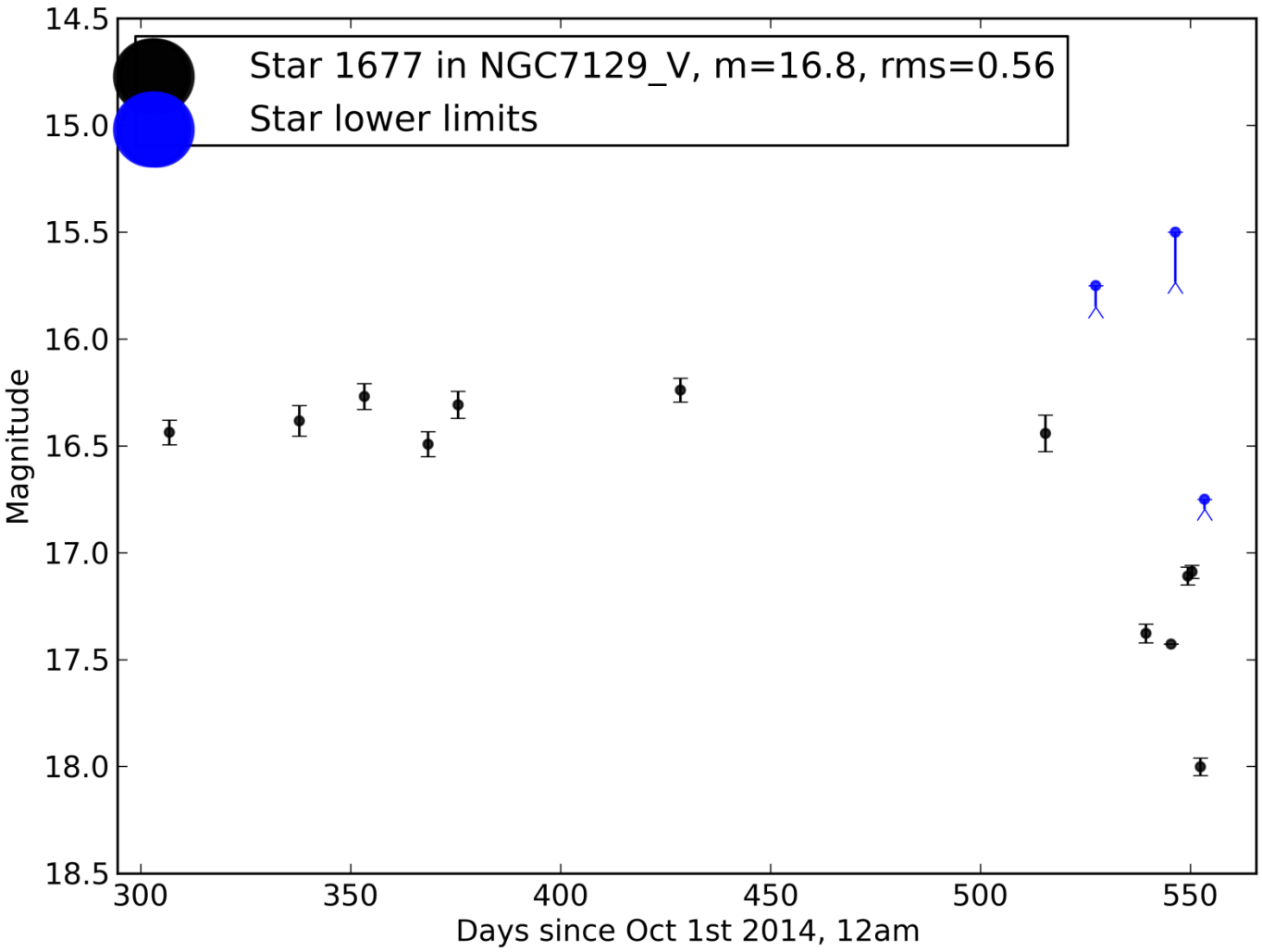
Hence no particularly requirements for the image quality.

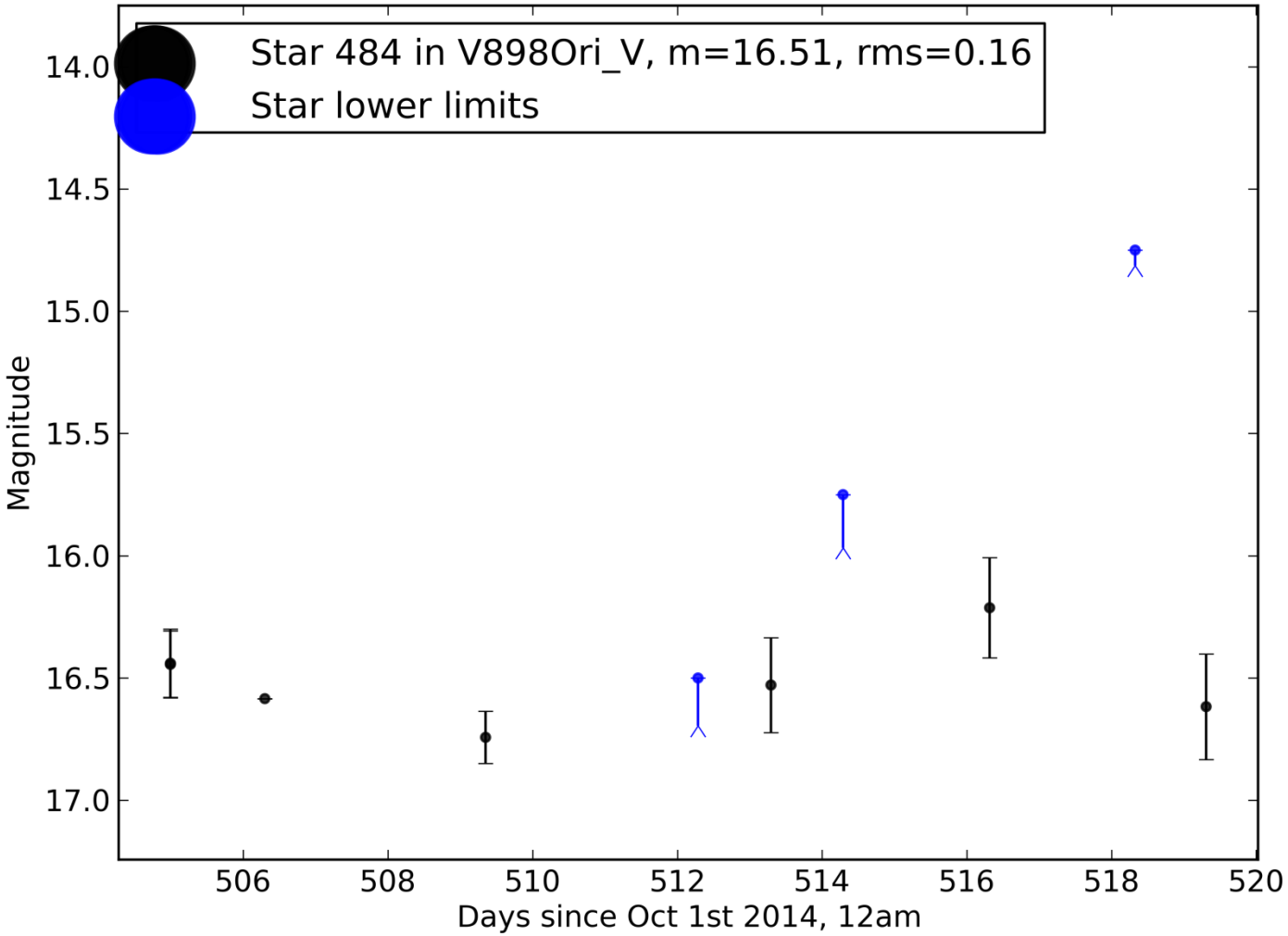
But to increase the usefulness and accuracy of the measurements, all images should be subject to a dark and flatfield correction.

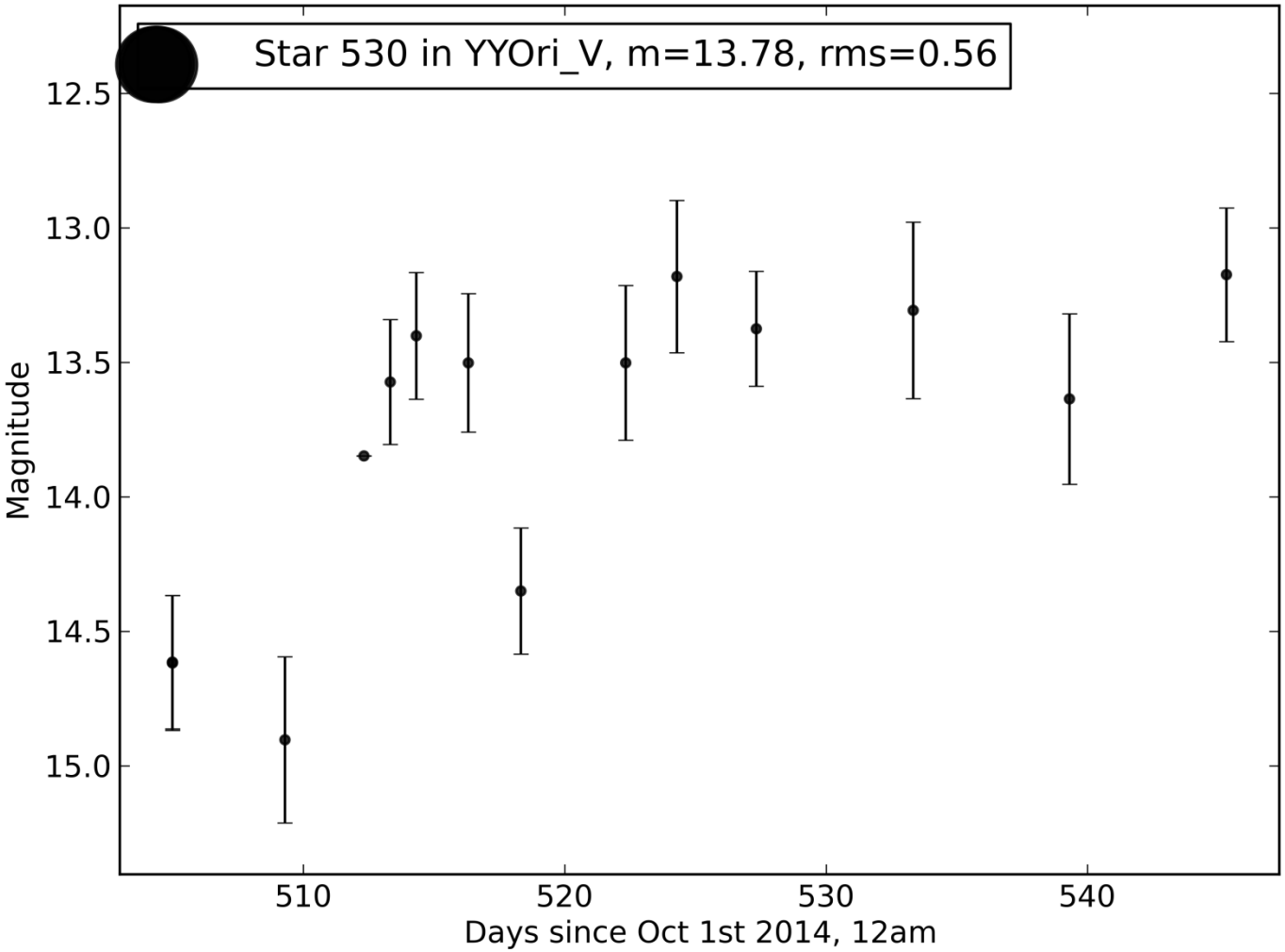
http://www.britastro.org/vss/froebrich.htm

Some Results:

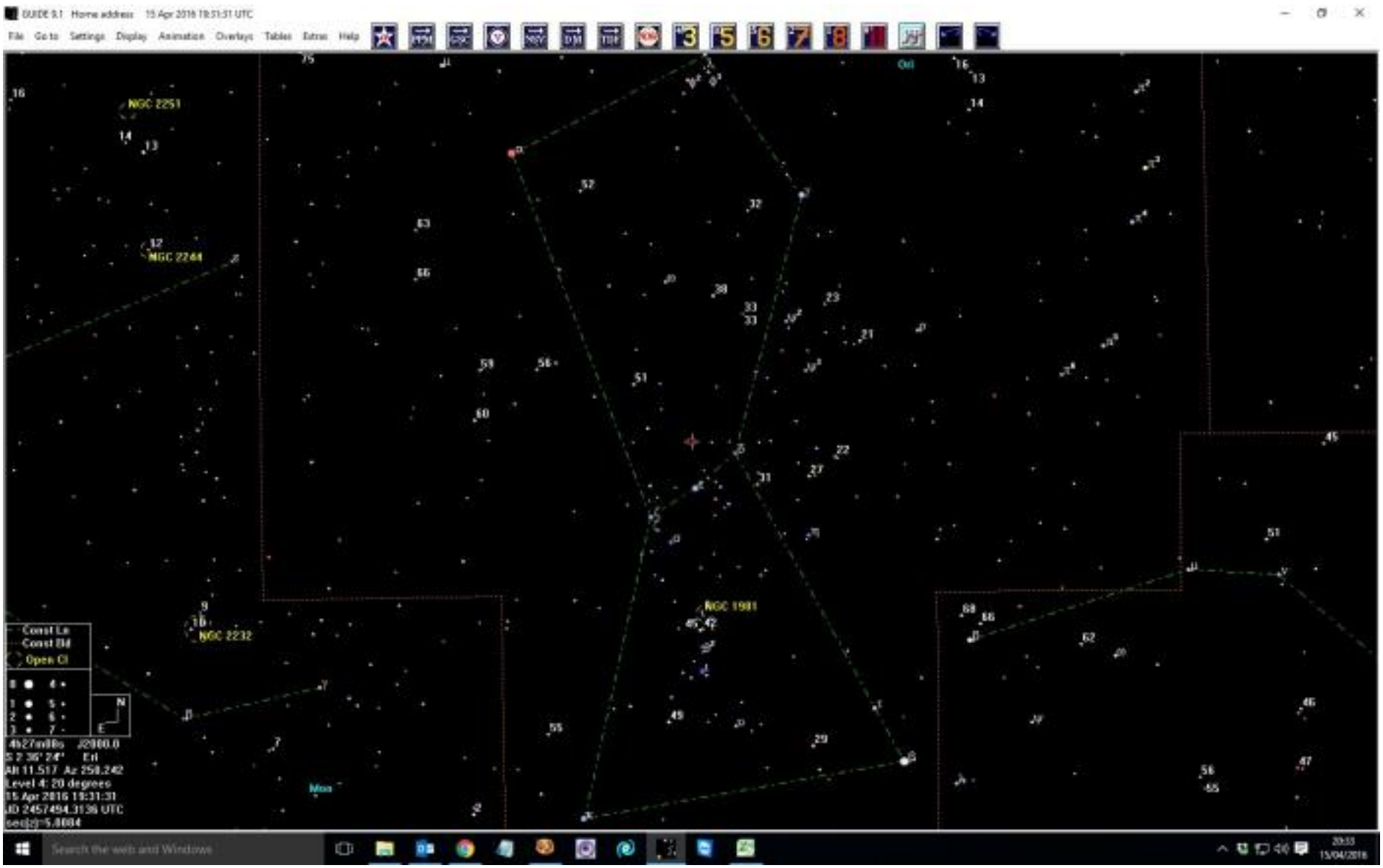



Star 1677 in NGC7129_V, m=16.8, rms=0.56
Star lower limits
Magnitude
Days since Oct 1st 2014, 12am
14.5
15.0
15.5
16.0
16.5
17.0
17.5
18.0
18.5
300
350
400
450
500
550

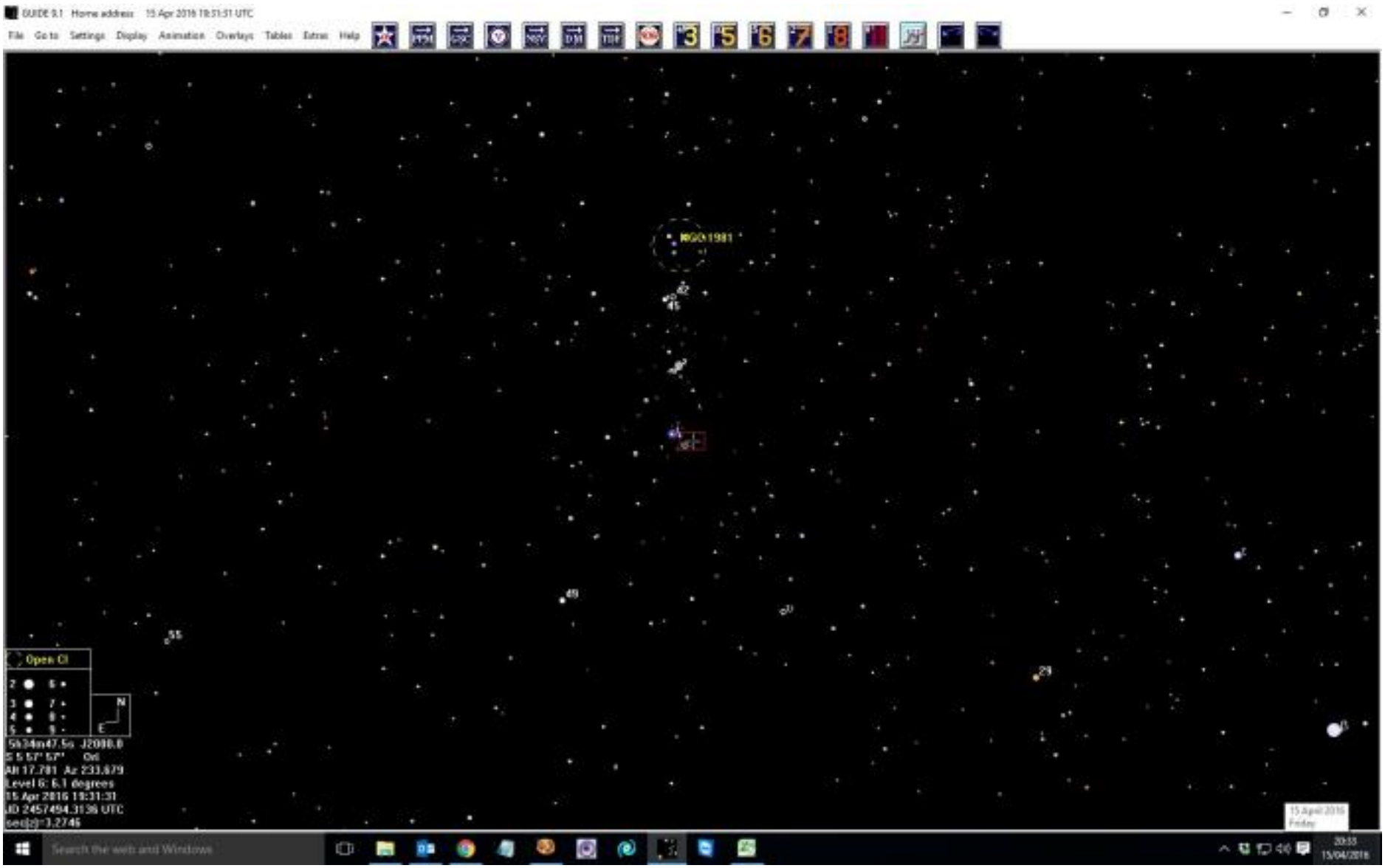

Star 484 in V898Ori_V, m=16.51, rms=0.16
Star lower limits
Magnitude
14.0
14.5
15.0
15.5
16.0
16.5
17.0
506
508
510
512
514
516
518
520
Days since Oct 1st 2014, 12am


Star 530 in YYOri_V, m=13.78, rms=0.56
Magnitude
12.5
13.0
13.5
14.0
14.5
15.0
510
520
530
540
Days since Oct 1st 2014, 12am

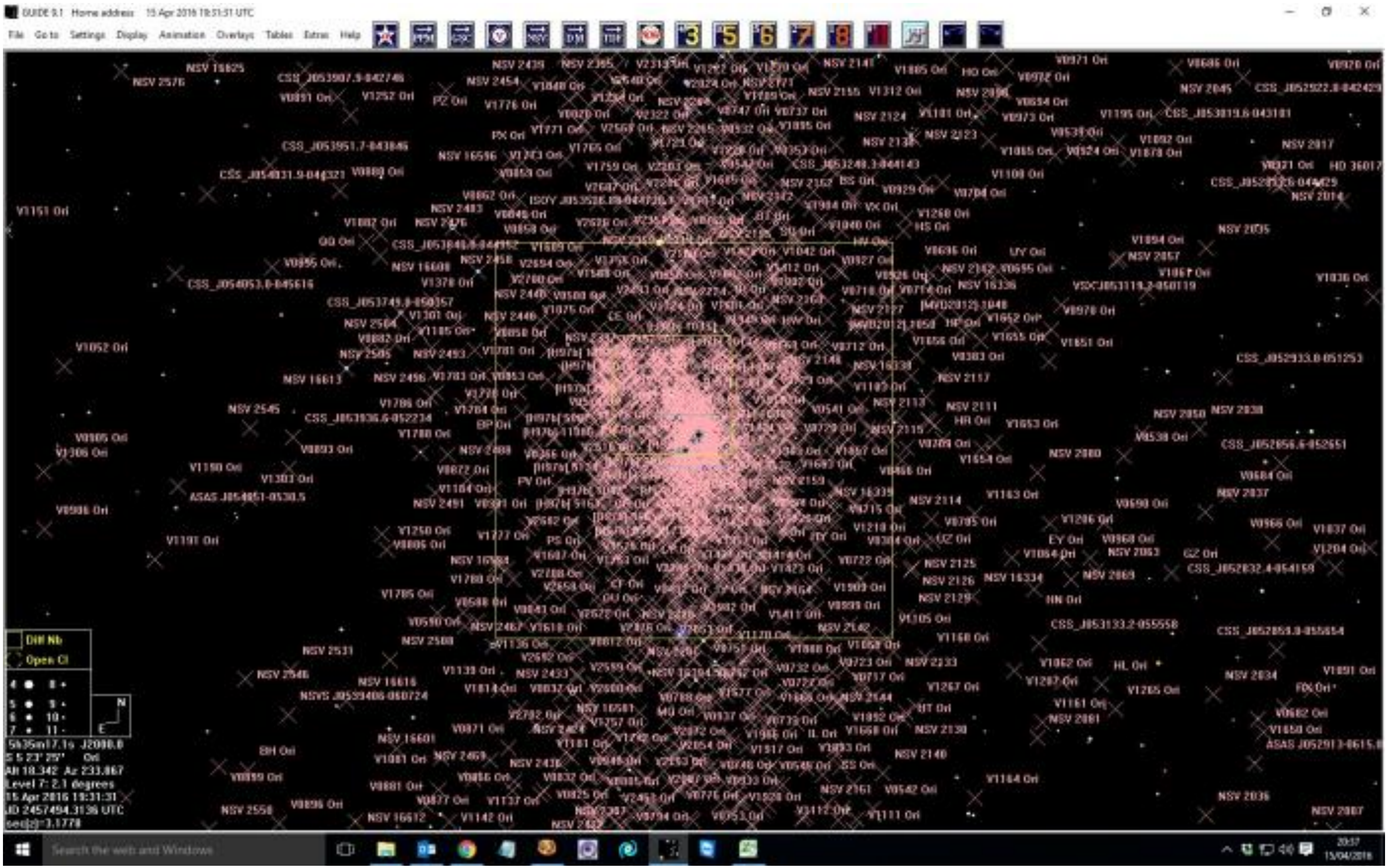
20d Field of YY Ori



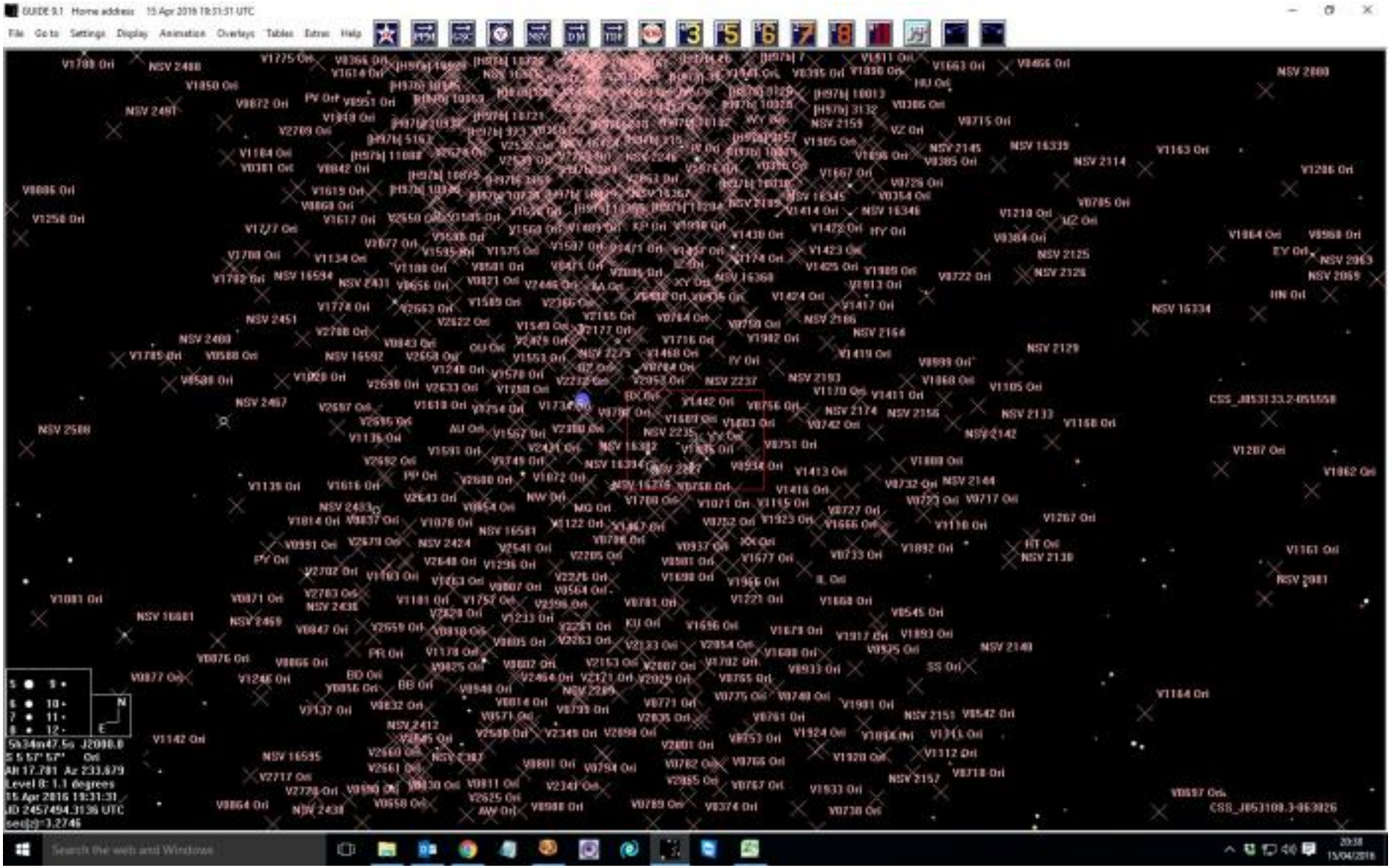
6d Field of YY Ori



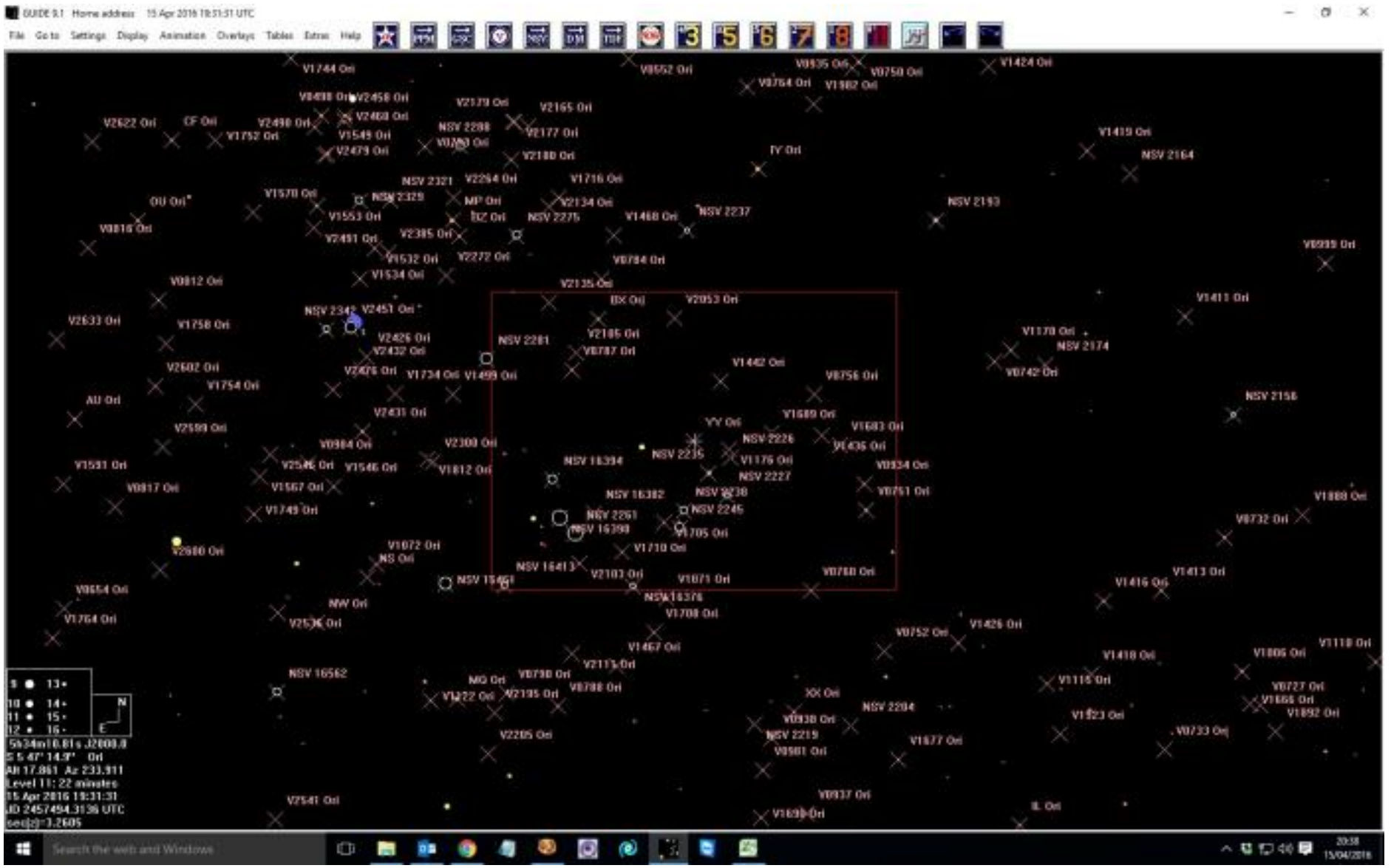
2d Field of YY Ori



1d Field of YY Ori



22m Field of YY Ori



Summary

You may not have thought of making variable star observations yet?

Please give it some serious thought.

There is an urgent call for very many more observations to support the work of the professional community.

They can be Visual, CCD or DSLR.

Thank You

Any questions?