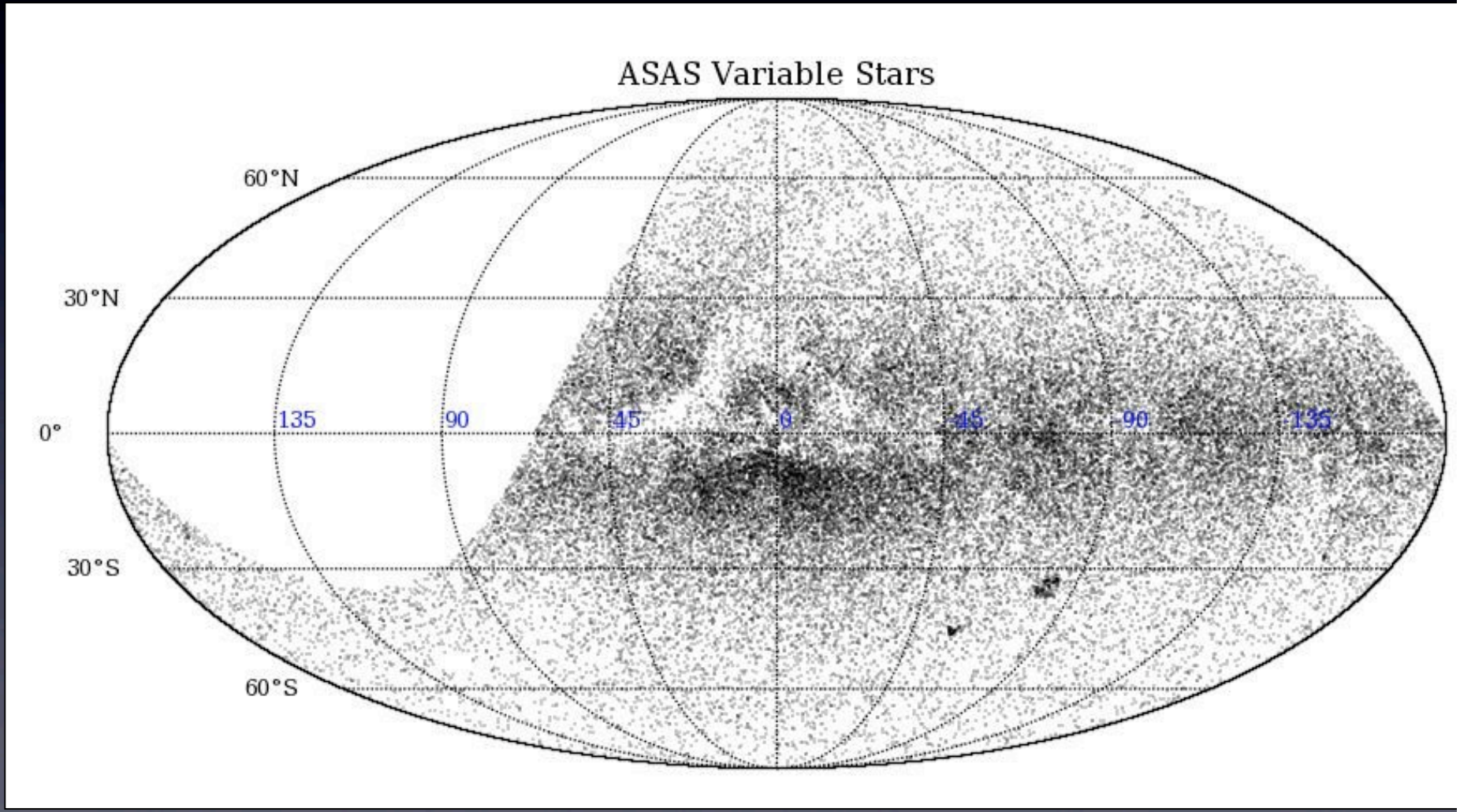
Using the ASAS-3 Database

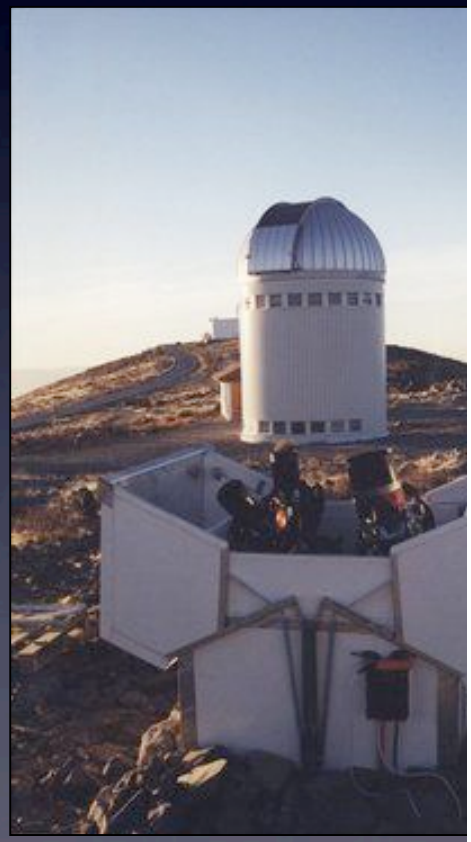
A. Price 97th AAVSO Annual Meeting
October 16-19, Nantucket, MA
Special Thanks to Sebastian Otero and Mike Simonsen



ASAS

- All Sky Automated Survey
- Prof. Bohdan Paczynski & Dr. Grzegorz Pojmański
- Inexpensive all sky cameras for every amateur's backyard
- Public data
- AAVSO has permission to include ASAS data in the database
- Use for finding comparison stars
- Or personal projects

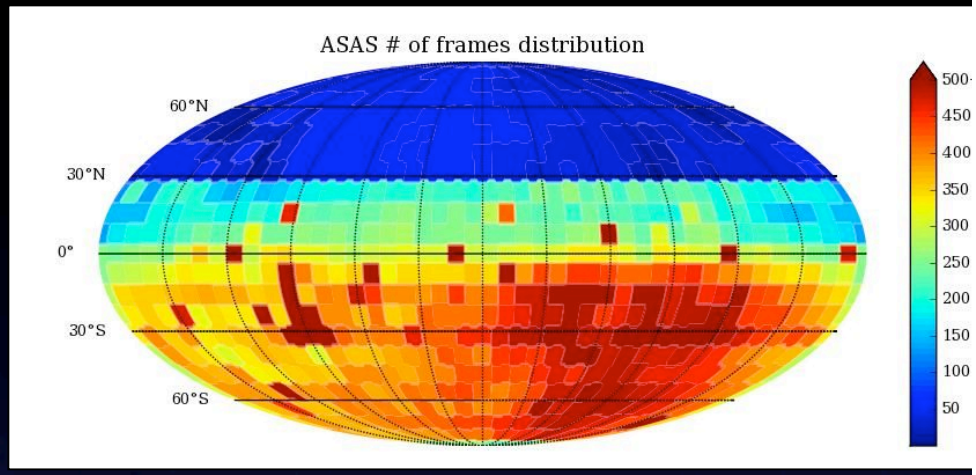
Prof. Paczynski (Yal

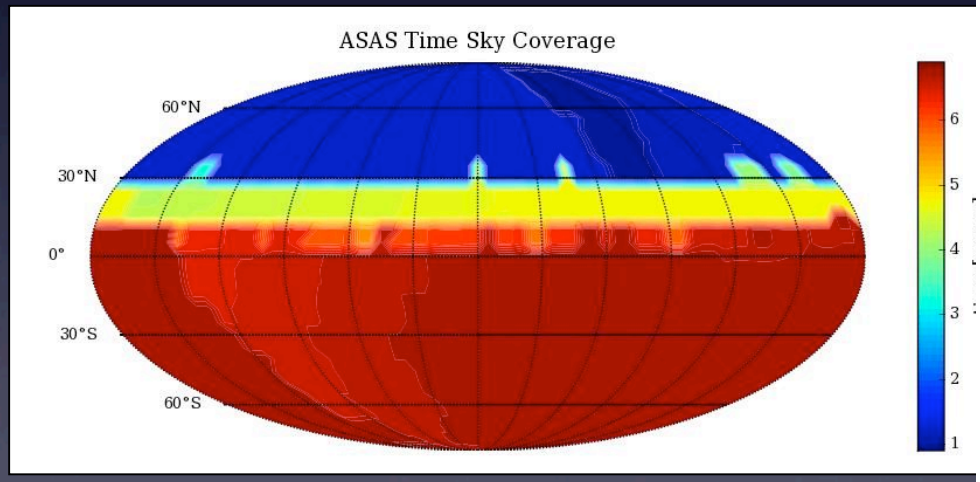


ASAS-3 (Chile

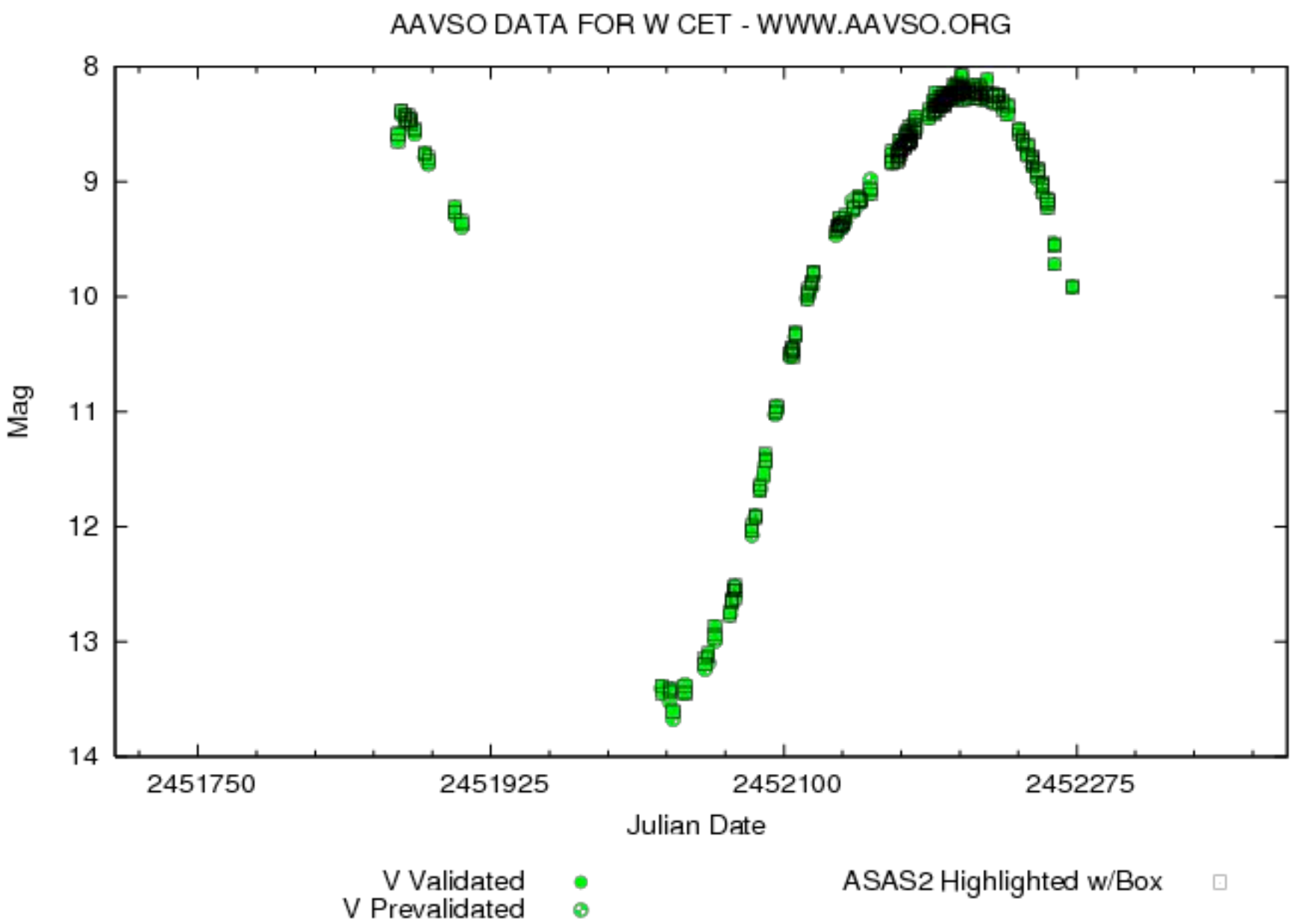
ASAS-3

- 20,000,000 stars
- Mag 8-14
- South of +28°
- All sky since June, 2006
- Cadence: 1-3 days
- 36,858 ASAS-2 V Data
- 16,230 ASAS-2 Ic Data
- 105,028 ASAS-3 V Data loaded by Sean Dvorak (DKS)
- 5,896 comp stars based on ASAS-3 data

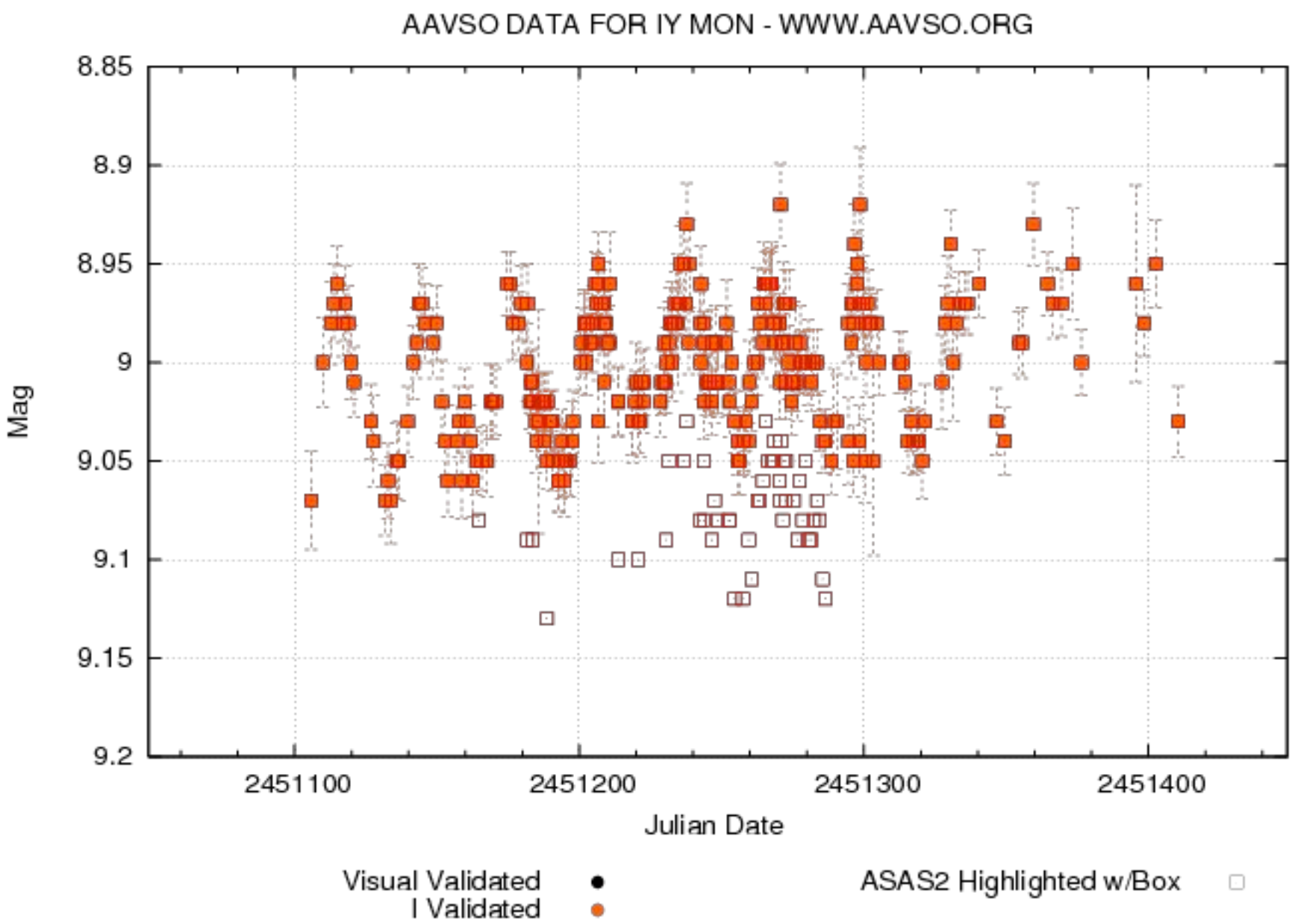




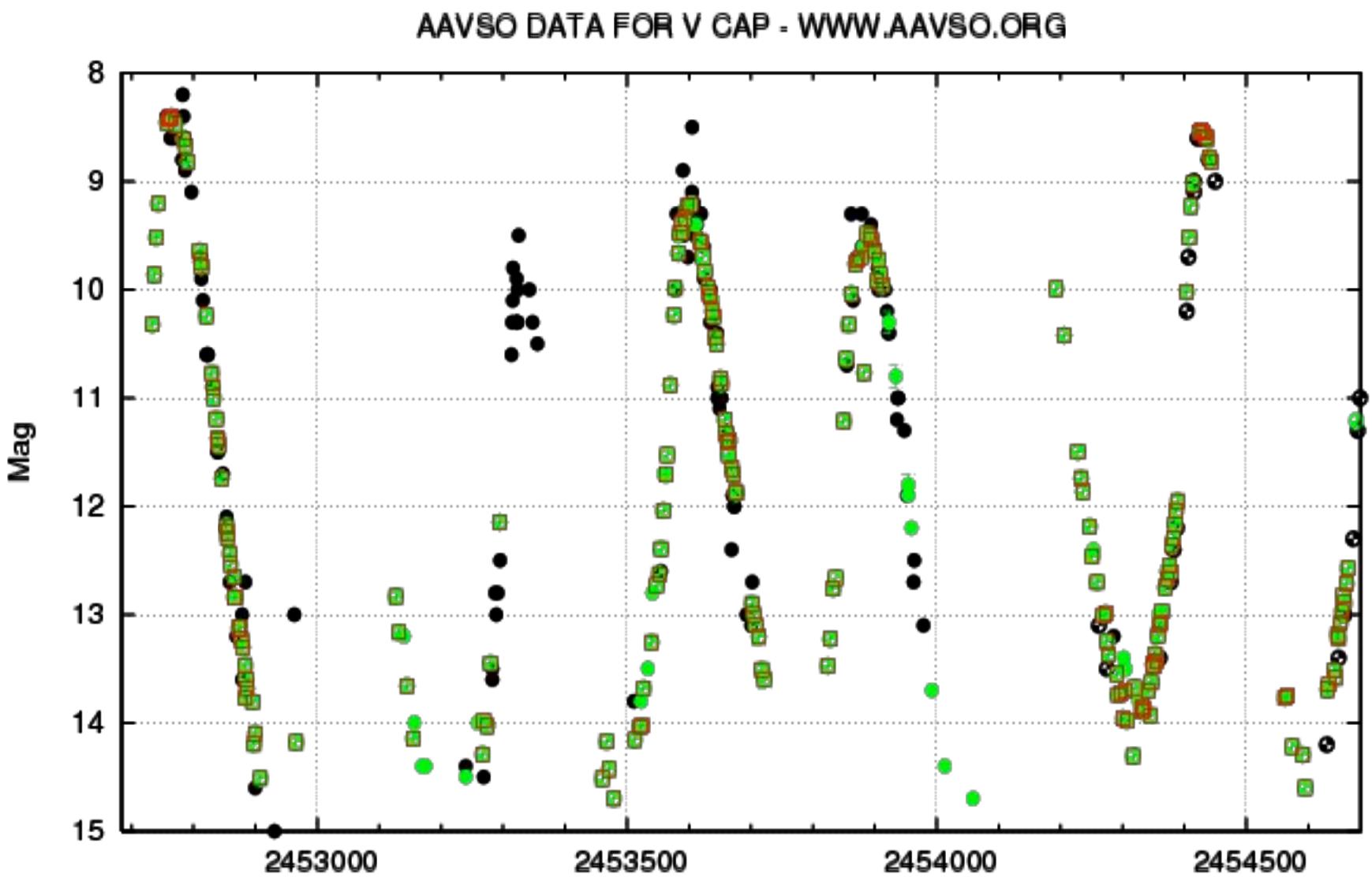
ASAS-2 (V)


AAVSO DATA FOR W CET - WWW.AAVSO.ORG
Mag
8
9
10
11
12
13
14
2451750
2451925
2452100
2452275
Julian Date
V Validated
V Prevalidated
ASAS2 Highlighted w/Box

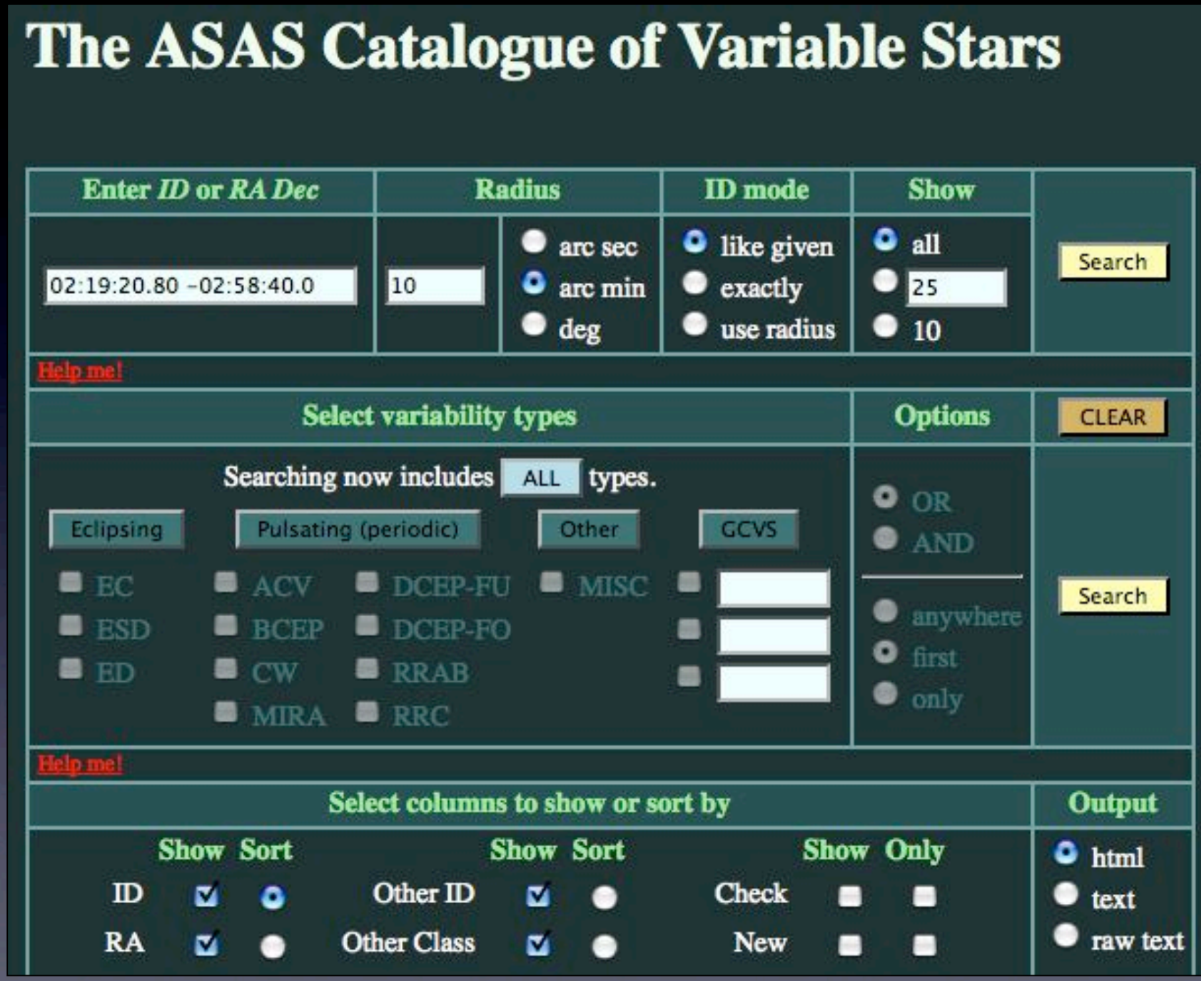
ASAS-2 (Ic)


AAVSO DATA FOR IY MON - WWW.AAVSO.ORG
8.85
8.9
8.95
9
9.05
9.1
9.15
9.2
Mag
2451100
2451200
2451300
2451400
Julian Date
Visual Validated
I Validated
ASAS2 Highlighted w/Box

ASAS-3 (V)

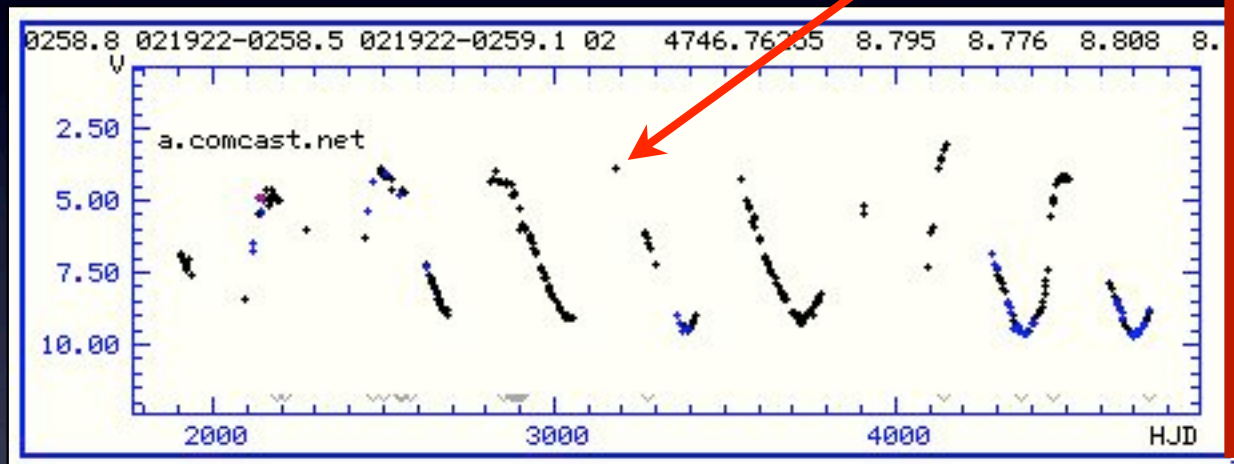

AAVSO DATA FOR V CAP - WWW.AAVSO.ORG
Mag
8
9
10
11
12
13
14
15
2453000
2453500
2454000
2454500

First, find the object...



ID ↓	RA (2000)	DEC (2000)	Period [days]	T_0	V [mag]	A [
021914-0256.5	02:19:14	-02:56:30	344	2502.1	12.68	1
021921-0258.8	02:19:21	-02:58:48	335	3023.8	4.89	4

Click for the image frame



GetData | Map | Image | DSS | USNO | 2MASS | SIMBAD | ROSAT | Try period: 335

Now, find the data...

Multiple datasets

```
# ######### LIGHT CURVE BEGINS NEXT LINE ############
#ndata= 9
#dataset= 1 ; 1 F0208-08_292
#desig= 021921-0258.7
#cra=    2.322378  02:19:20.6
#cdec=  -2.978169 -2:58:41.4
#class= 0
#cmag_0=  6.151
#cmer_0=  0.425
#nskip_0= 1
#cmag_1=  5.969
#cmer_1=  0.512
#nskip_1= 1
#cmag_2=  5.753
#cmer_2=  0.678
#nskip_2= 1
#cmag_3=  5.628
#cmer_3=  0.739
#nskip_3= 1
#cmag_4=  5.574
#cmer_4=  0.773
#nskip_4= 1
#ra=    2.322378  02:19:20.6
#dec=  -2.978169 -2:58:41.4
#      HJD       MAG_4  MAG_0  MAG_1  MAG_2  MAG_3    MER_4 MER_0 MER_1 MER_2 MER_3 GRADE FR
   2115.87330  6.523  6.674  6.596  6.584  6.535    0.027 0.032 0.024 0.021 0.024  A 26968
   2117.83457  6.764  7.011  6.863  6.820  6.771    0.030 0.054 0.025 0.023 0.025  A 27391
   2135.83252  4.877  5.198  4.989  4.940  4.895    0.043 0.049 0.032 0.032 0.038  A 29512
   2144.80822  4.943  5.806  5.552  5.201  5.025    0.028 0.054 0.026 0.023 0.025  A 31076
   3382.55780  9.319  9.285  9.333  9.333  9.319    0.037 0.054 0.033 0.029 0.031  A 12559
#dataset= 1 ; 2 F0208-08_292
#desig= 021922-0258.8
#cra=    2.322694  02:19:21.7
#cdec=  -2.979891 -2:58:47.6
#class= 0
#cmag_0=  5.981
#cmer_0=  0.242
#nskip_0= 0
#cmag_1=  5.729
#cmer_1=  0.217
#nskip_1= 0
#cmag_2=  5.432
#cmer_2=  0.278
#nskip_2= 0
#cmag_3=  5.265
#cmer_3=  0.294
#nskip_3= 0
#cmag_4=  5.185
#cmer_4=  0.317
#nskip_4= 0
#ra=    2.322694  02:19:21.7
#dec=  -2.979891 -2:58:47.6
#      HJD       MAG_4  MAG_0  MAG_1  MAG_2  MAG_3    MER_4 MER_0 MER_1 MER_2 MER_3 GRADE FR
   2140.80576  5.408  6.151  5.882  5.628  5.472    0.037 0.061 0.037 0.033 0.034  A 30256
   2144.80822  4.963  5.812  5.577  5.236  5.059    0.028 0.054 0.026 0.023 0.025  A 31076
#dataset= 1 ; 3 F0208-08_292
```

With data, size matters

```
#dataset= 4 ; 2 F0208+00_337
#desig= 021921-0258.7
#cra=    2.322448  02:19:20.8
#cdec=  -2.977593 -2:58:39.3
#class= 0
#cmag_0=  7.461
#cmer_0=  1.681
#nskip_0= 1
#cmag_1=  7.428
#cmer_1=  1.747
#nskip_1= 0
#cmag_2=  7.397
#cmer_2=  1.782
#nskip_2= 0
#cmag_3=  7.380
#cmer_3=  1.805
#nskip_3= 0
#cmag_4=  7.375
#cmer_4=  1.812
#nskip_4= 0
#ra=    2.322448  02:19:20.8
#dec=  -2.977593 -2:58:39.3
#      HJD        MAG_4   MAG_0   MAG_1   MAG_2   MAG_3    MER_4 MER_0 MER_1 MER_2 MER_3 GRAD
   1903.58667   6.849   7.269   7.002   6.916   6.858    0.025 0.049 0.022 0.019 0.021   A 3
   1908.58456   6.987   7.257   7.111   7.058   7.004    0.025 0.040 0.027 0.021 0.023   A 4
   1915.53393   7.089   7.554   7.272   7.165   7.103    0.033 0.046 0.027 0.025 0.029   A 4
   1919.59243   7.226   7.608   7.382   7.293   7.240    0.033 0.049 0.032 0.026 0.029   A 5
   1922.55938   7.362   7.780   7.553   7.449   7.375    0.023 0.038 0.028 0.020 0.021   A 5
   1925.56129   7.431   7.803   7.572   7.493   7.439    0.026 0.047 0.029 0.022 0.024   A 6
   1930.52692   7.042   7.172   7.088   7.053   7.052    0.058 0.055 0.044 0.044 0.050   A 7
   1934.52542   7.571   7.911   7.673   7.620   7.579    0.030 0.041 0.030 0.024 0.026   A 7
   2094.86387   8.469   8.509   8.494   8.484   8.471    0.046 0.075 0.039 0.036 0.041   A 2
   2129.77396   5.463   6.016   5.645   5.537   5.478    0.068 0.093 0.064 0.062 0.065   B 2
   2156.73986   4.656   5.131   4.774   4.649   4.597    0.053 0.057 0.047 0.048 0.052   B 3
   2167.74685   4.925   6.033   5.686   5.284   5.033    0.032 0.053 0.030 0.027 0.028   A 3
   2168.75749   4.925   6.012   5.683   5.293   5.040    0.032 0.055 0.032 0.027 0.029   A 3
   2172.71089   4.787   5.362   5.000   4.851   4.773    0.034 0.046 0.032 0.030 0.032   A 3
   2173.74103   4.916   5.883   5.572   5.179   5.001    0.029 0.051 0.028 0.024 0.027   A 3
   2174.73650   4.643   5.414   5.249   4.936   4.728    0.043 0.064 0.045 0.034 0.038   A 3
   2177.70711   4.873   5.731   5.500   5.142   4.963    0.033 0.055 0.033 0.027 0.030   A 3
   2183.67780   4.951   5.722   5.541   5.218   5.042    0.036 0.054 0.034 0.029 0.032   A 3
   2188.82268   4.893   5.496   5.264   5.067   4.948    0.033 0.049 0.038 0.030 0.032   A 3
   2190.65865  29.999  29.999  29.999  29.999  29.999    0.033 0.044 0.030 0.027 0.030   C 3
   2194.69396   5.018   5.620   5.489   5.203   5.090    0.031 0.040 0.031 0.025 0.028   A 3
   2211.58713  29.999  29.999  29.999  29.999  29.999    0.036 0.042 0.033 0.030 0.033   C 3
```

- Aperture Criteria
- cmag_0 = >12.0
- cmag_1 = 11 - 12
- cmag_2 = 10 - 11
- cmag_3 = 9 - 10
- cmag_4 = <9

# HJD	MAG_1	MAG_0	MAG_2	MAG_3	MAG_4	MER_1	MER_0	MER_2	MER_3	MER_4	GRADE	FRA
1981.89917	11.314	11.333	11.298	11.287	11.290	0.042	0.044	0.037	0.041	0.042	A	12671
1983.91106	11.363	11.359	11.327	11.237	11.246	0.056	0.061	0.053	0.060	0.060	B	12889
1985.88935	11.258	11.264	11.260	11.269	11.232	0.042	0.046	0.036	0.040	0.039	A	13265
1994.90607	11.158	11.168	11.140	11.164	11.148	0.052	0.060	0.047	0.053	0.052	B	13562

Beware of Saturation!

Differences between aperture magnitudes is too large

# HJD	MAG_4	MAG_0	MAG_1	MAG_2	MAG_3
1903.58667	6.849	7.269	7.002	6.916	6.858
1908.58456	6.987	7.257	7.111	7.058	7.004
1915.53393	7.089	7.554	7.272	7.165	7.103
1919.59243	7.226	7.608	7.382	7.293	7.240
1922.55938	7.362	7.780	7.553	7.449	7.375
1925.56129	7.431	7.803	7.572	7.493	7.439
1930.52692	7.042	7.172	7.088	7.053	7.052
1934.52542	7.571	7.911	7.673	7.620	7.579
2094.86387	8.469	8.509	8.494	8.484	8.471

Better...

Beware of Crowding!

# HJD	MAG_1	MAG_0	MAG_2	MAG_3	MAG_4	M
2628.82965	12.131	12.299	11.840	11.591	11.500	0
2679.78280	11.997	12.281	11.819	11.671	11.614	0

Check the field and other apertures

Beware of mean mags!

HD 109993

```
#ndata= 411
#dataset= 3 ; 1 F1200-64_048
#desig= 123950-6702.4
#cra=    12.663945  12:39:50.2
#cdec= -67.039741 -67:02:23.1
#class= 0
#cmag_0=  7.952
#cmer_0=  0.025
#nskip_0= 3
#cmag_1=  7.978
#cmer_1=  0.021
#nskip_1= 2
#cmag_2=  7.997
#cmer_2=  0.010
#nskip_2= 9
#cmag_3=  8.009
#cmer_3=  0.013
#nskip_3= 7
#cmag_4=  8.024
#cmer_4=  0.015
#nskip_4= 5
#ra=    12.663945  12:39:50.2
#dec= -67.039741 -67:02:23.1
```

- Saturation causes artificially low means (DIY)
- Zero point calibration issues (calibrate using external sources or use old ASAS catalog)

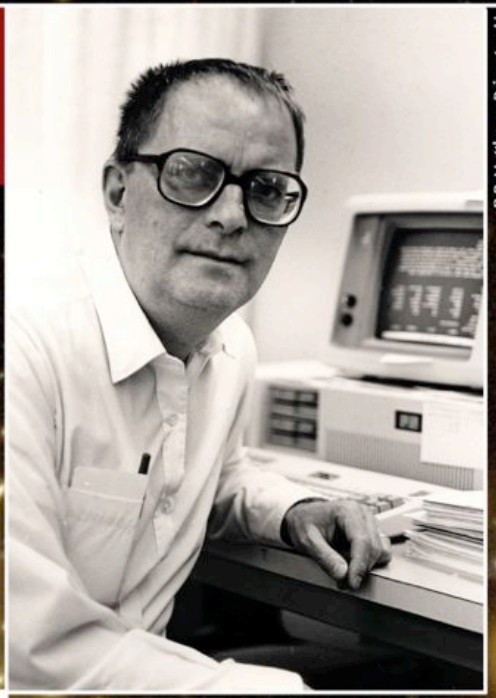
```
#ndata= 555
#dataset= 4 ; 1 F1300-64_
#desig= 123951-6702.4
#cra=    12.664160  12:39:
#cdec= -67.040732 -67:02:
#class= 0
#cmag_0=  8.182
#cmer_0=  0.033
#nskip_0= 19
#cmag_1=  8.185
#cmer_1=  0.024
#nskip_1= 17
#cmag_2=  8.190
#cmer_2=  0.014
#nskip_2= 25
#cmag_3=  8.198
#cmer_3=  0.016
#nskip_3= 27
#cmag_4=  8.208
#cmer_4=  0.019
#nskip_4= 24
#ra=    12.664160  12:39:5
#dec= -67.040732 -67:02:2
```

Using the Data

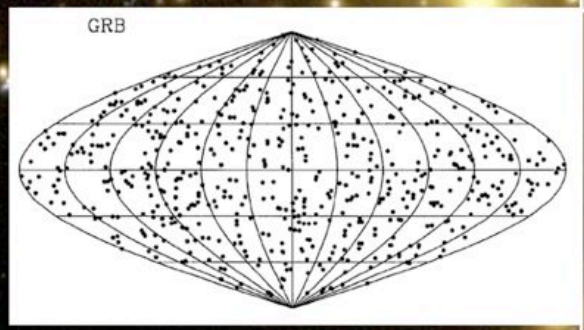
- Ignore data sets with <10 obs (star may be on edge)
- Reported accuracy is based on night-to-night variation
- Add 0.05 in quadrature to the ASAS uncertainty and report *that* numb (for now)
- Submit via *Extended Format*
- Use ASAS3 as the observer code
- Put "Submitted by X" in the Remarks where X is *your* observer code
- Put ASAS in the Chart, Cname and Kname fields
- Send an e-mail to aavso@aavso.org so we can credit your observer to
- Database is alive and always changing
- When using ASAS data in a publication, describe how you chose which aperture and data set to use.
- Also, include a citation to:
- Pojmanski, G. 2002, Acta Astronomica, 52, 397

THE VARIABLE UNIVERSE
A CELEBRATION OF BOHDAN PACZYŃSKI

MEMORIAL SERVICE - 9.28.07 - 3PM
SYMPOSIUM - 9.29.07 & 9.30.07
PRINCETON UNIVERSITY


R.P. Matthews, Princeton U.

stellar evolution
variable stars
accretion disks
gamma ray bursts
micro-lensing



INVITED SPEAKERS

MAREK ABRAMOWICZ
CHARLES ALCOCK
ANDREW GOULD
CHRYSSA KOUVELIOTOU
TSVI PIRAN
GRZEGORZ POJMAŃSKI
GEORGE PRESTON
VIRGINIA TRIMBLE
ANDRZEJ UDALSKI

Conference Registration - Deadline 8.15.07 - www.astro.princeton.edu/paczynski
Contact - schaos@astro.princeton.edu