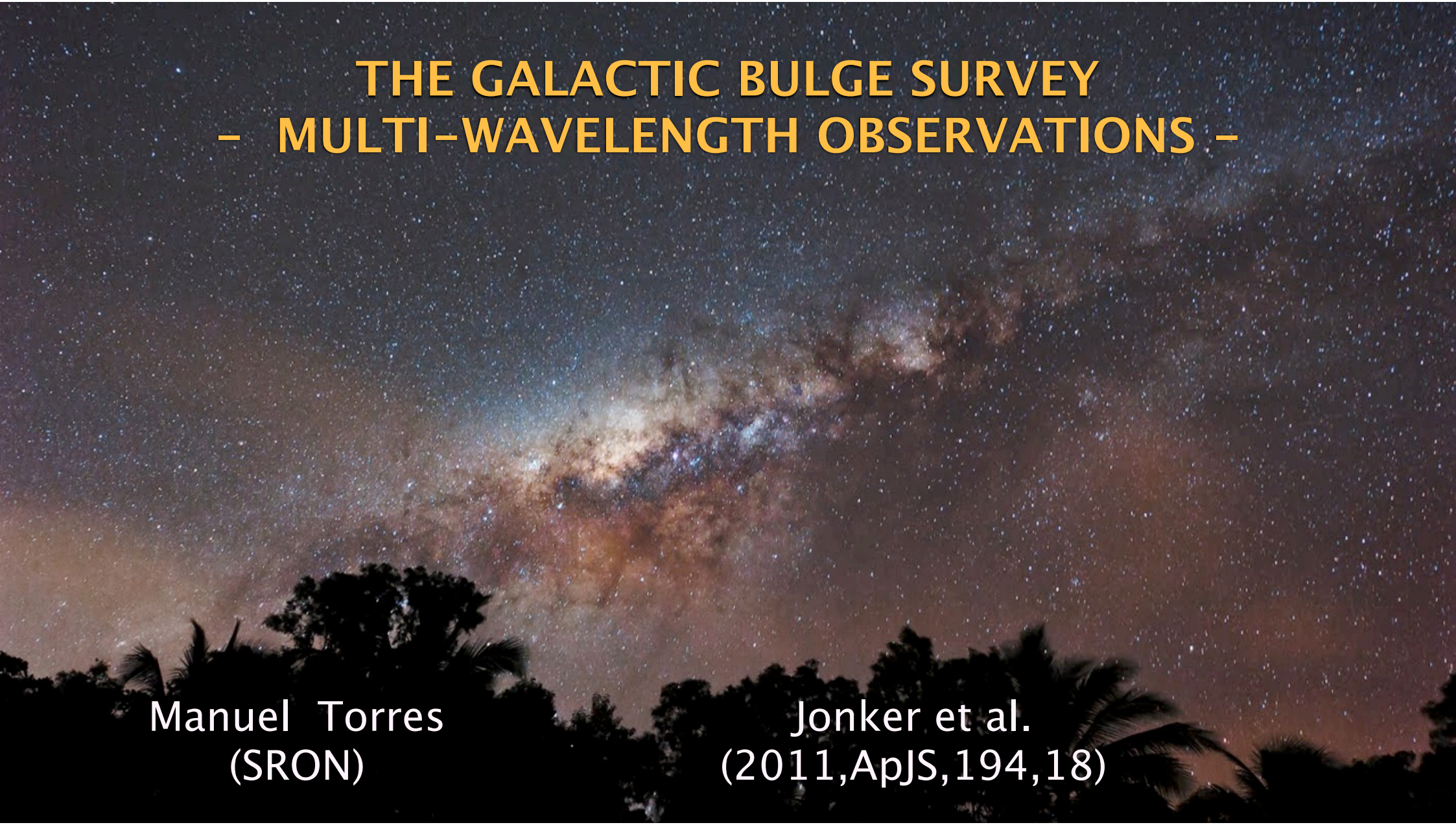


THE GALACTIC BULGE SURVEY
– MULTI-WAVELENGTH OBSERVATIONS –

Manuel Torres
(SRON)

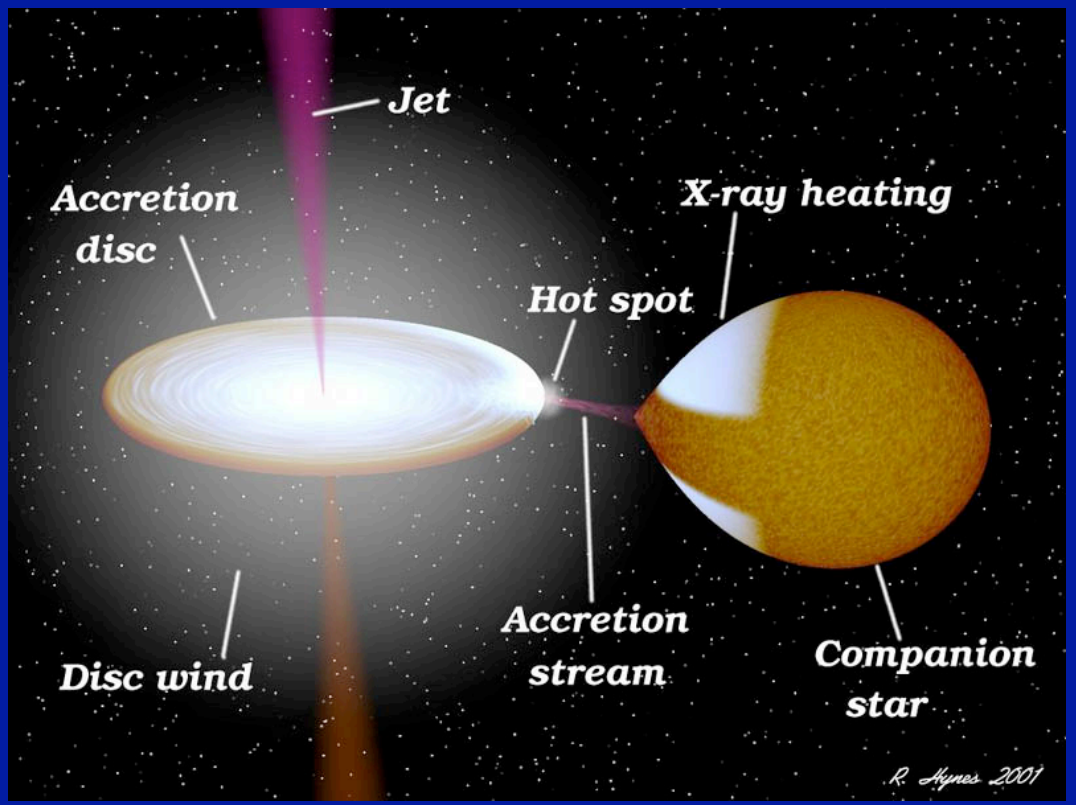
Jonker et al.
(2011,ApJS,194,18)

Forensic Team:

P. Jonker[1,2,3], C. Bassa[1,2,4], G. Nelemans[2], D. Steeghs[3,5], T. Maccarone[6], R. Hynes[7], S. Greiss[5], J. Clem[7], A. Dieball[6], V. Mikles[7], C. Britt[7], L. Gossen[7], A. Collazzi[7], R. Wijnands[8], J. In't Zand[1], M. Méndez[9], N. Rea[10], E. Kuulkers[11], E. Ratti[1], L. van Haaften[2], C. Heinke[12], F. Özel[13], P. Groot[2], and F. Verbunt[1,14]

[1] SRON, [2] Radboud Univ. Nijmegen, [3] Harvard-Smithsonian Center for Astrophysics, [4] Jodrell Bank Centre for Astrophysics, Univ. of Manchester, [5] Univ. of Warwick, [6] Univ. of Southampton, [7] Louisiana State University, [8] Astronomical Institute "Anton Pannekoek," [9] Kapteyn Astronomical Institute, Univ. of Groningen, [10] CSIC, [11] ISOC, ESA/ESAC, [12] Univ. of Alberta, [13] Steward Observatory, Univ. of Arizona, [14] Astronomical Institute, Utrecht University.

X-ray binary drawing



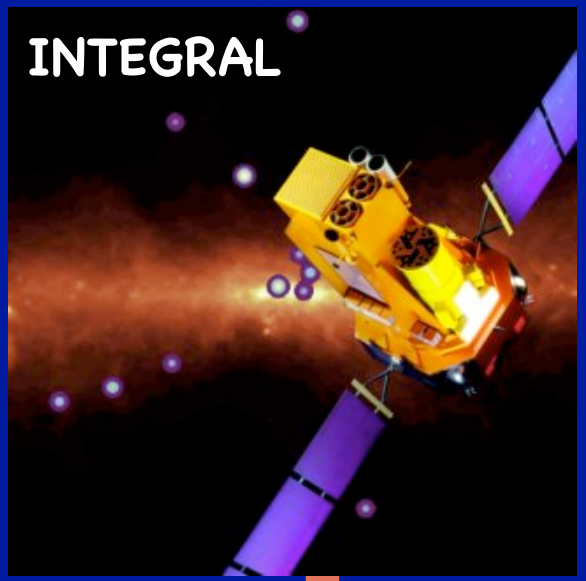
Census of Low-mass X-ray binaries:

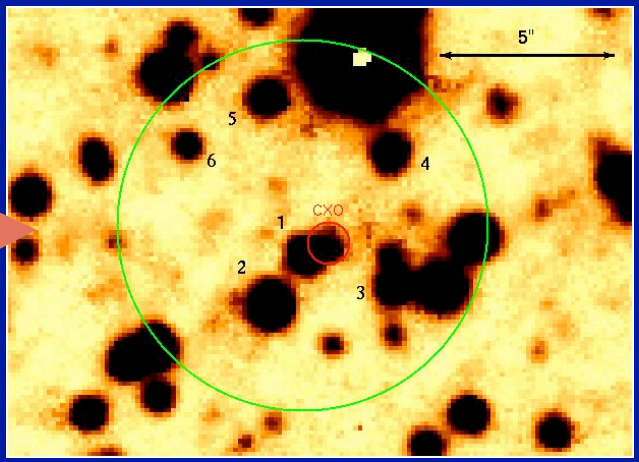
THE POPULATION OF LOW-MASS X-RAY BINARIES IN THE GALAXY.

Primary	Type	Number	Fraction
Neutron Star	Persistent	46	28%
Neutron Star	Transient	39	23%
Confirmed BH	Persistent	0	0%
Confirmed BH	Transient	16	9%
BH Candidate	Persistent	2	1%
BH Candidate	Transient	30	18%
Unidentified	Persistent	7	4%
Unidentified	Transient	3	2%
Little Information	Persistent	17	11%
Little Information	Transient	7	4%

Total transients: 95

X-ray transients: Discovery.





Outside
GCN
IAUCs
Other
MacOS: Dashboard Widget
Follow ATel on Twitter
ATELstream
ATel Community Site

The Astronomer's Telegram

Telegram | Search | Information
Telegram Index
Obtain ... | Post | RSS Feeds | Email Settings

Present Time: 4 Jun 2012; 15:00 UT

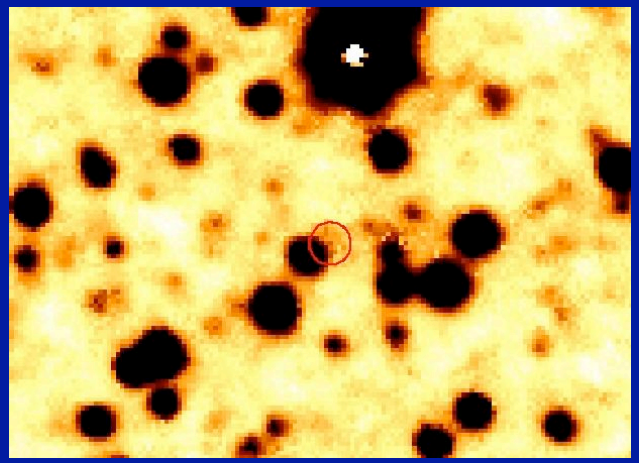
[Previous | Next | ADS]

IGR J17497-2821: a new hard X-ray transient detected by INTEGRAL.

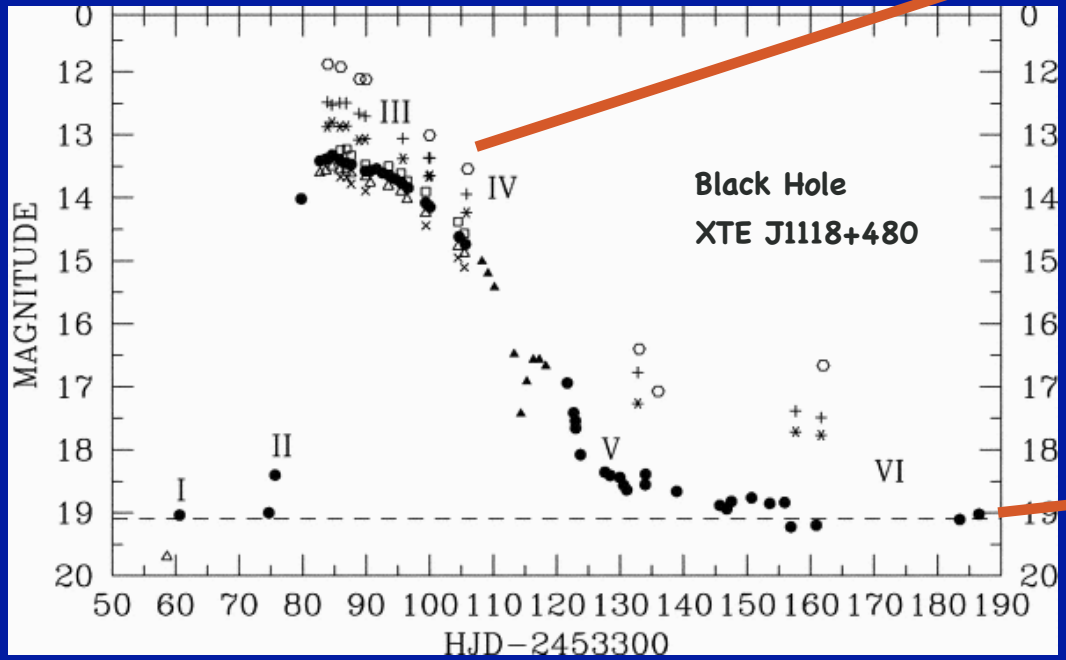
ATel #885; *Soldi S., Walter R., Eckert D., Balman S., Bazzano A., Beckmann V., Belloni T., Boggs S., Capitanio F., Chenevez J., Del Santo M., Diehl R., Donnarumma I., Goldoni P., Gotz D., Leyder J.-C., Mereghetti S., Paizis A., Pottschmidt K., Sidoli L., Tarana A., Tueller J., Watanabe K., Weidenspointner G.*
on 18 Sep 2006; 13:49 UT
Distributed as an Instant Email Notice Transients
Credential Certification: Roland Walter (Roland.Walter@obs.unige.ch)

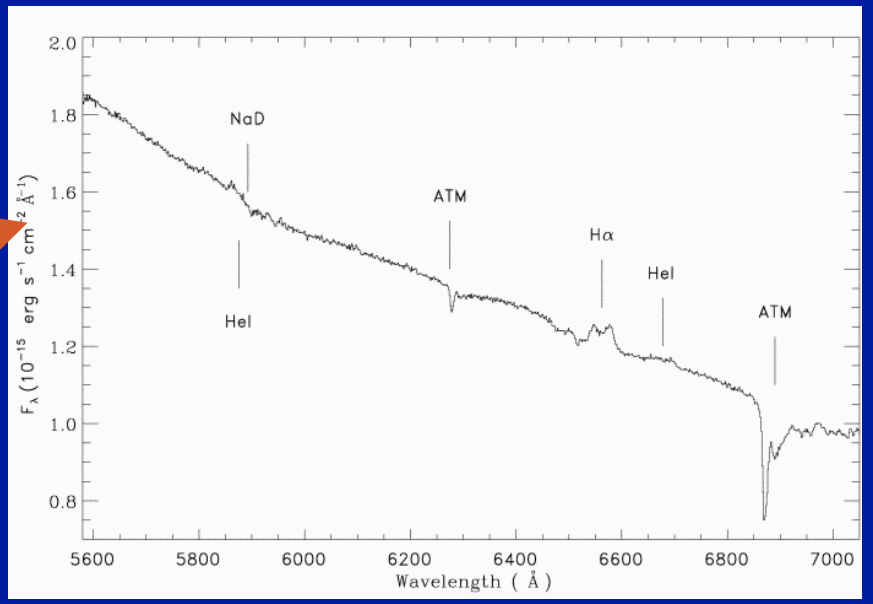
Subjects: X-ray, Gamma Ray, Transient

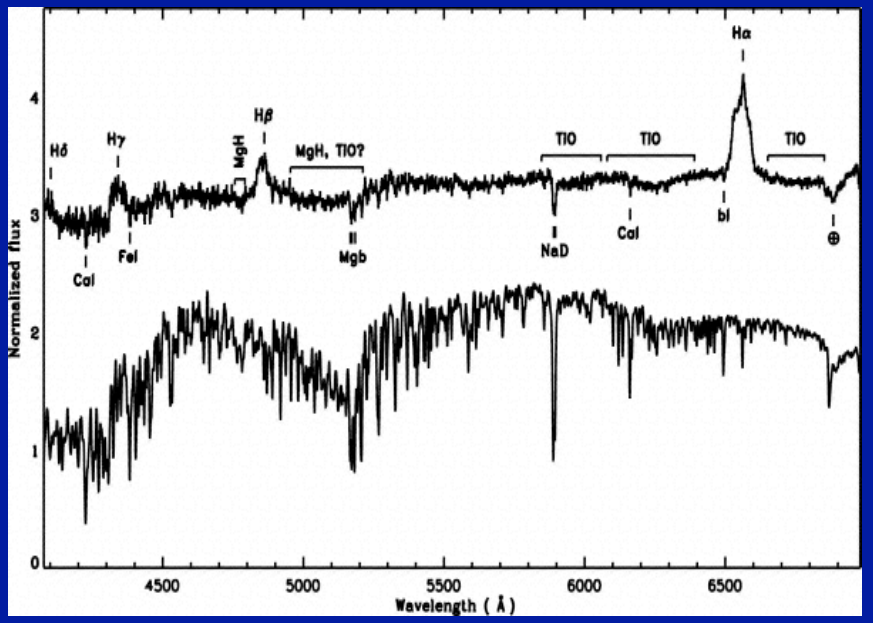
6 months after...



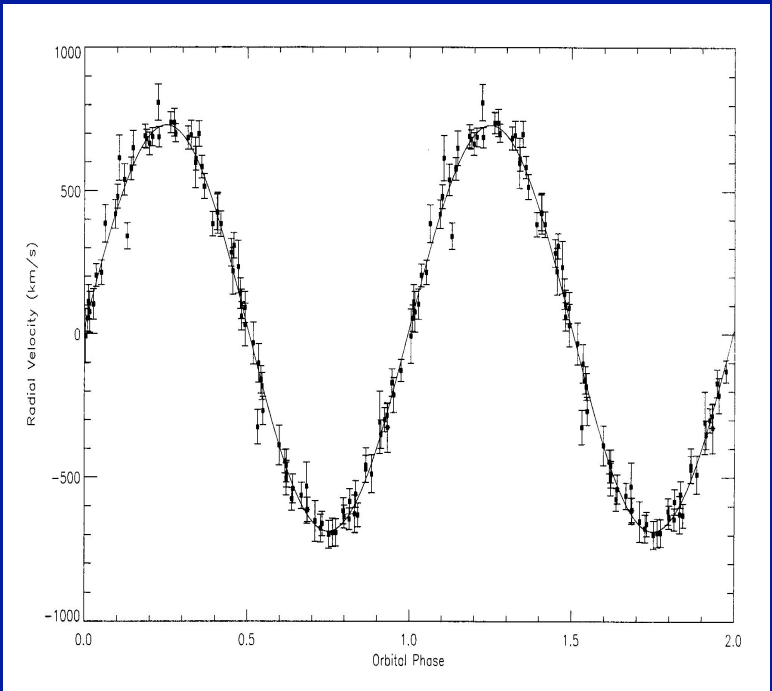
X-ray transients:







During quiescence, the absorption lines of the companion star are visible and dynamical constraints on the mass of both stars can be determined.



Radial Velocity Curve fit:

$$V = \gamma + K_2 \sin\left[\frac{2\pi}{P_{orb}}(t - T_0)\right]$$

Mass function:

$$f(M) = \frac{K_2^3 P_{orb}}{2\pi G} = \frac{M_1 \sin^3 i}{(1+q)^2}, q = \frac{M_2}{M_1}$$

The GBS goals:

- Find (eclipsing) low-mass X-ray binaries in quiescence.

  Model independent mass measurements black-hole formation and neutron star Equation of State.

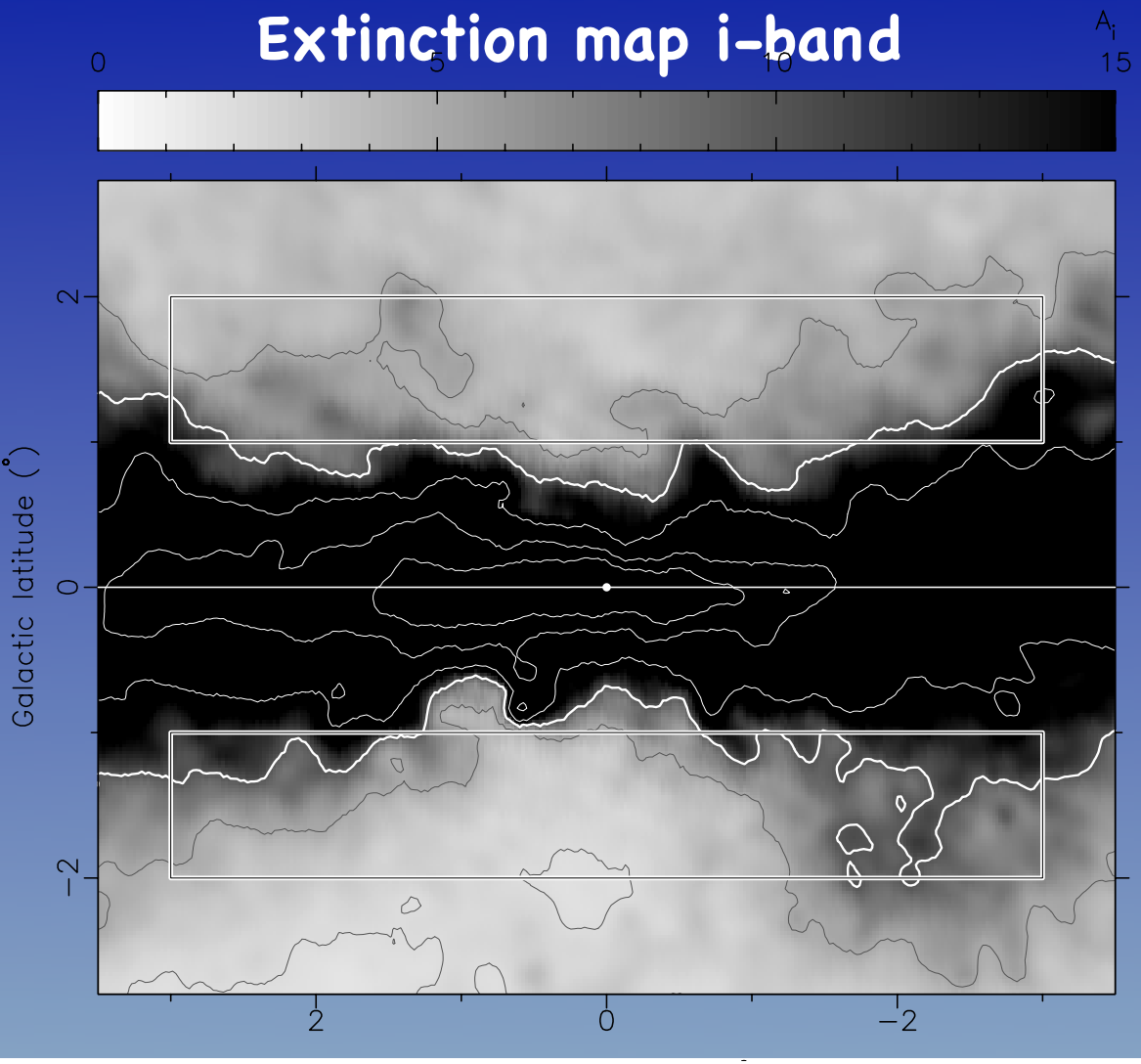
- Constraining common envelope evolution via number counts.

  Cataclysmic variables and ultra-compact low-mass X-ray binaries.

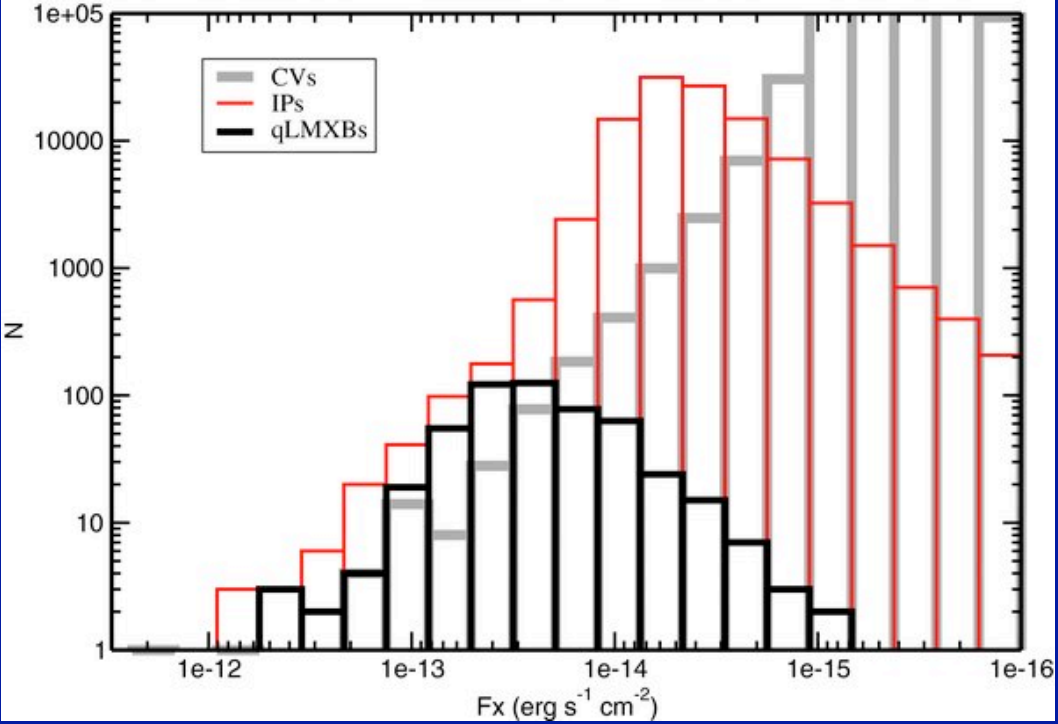
- Spatial distribution of LMXBs in the Bulge.

  Galactic Structure and formation.

The GBS area:



The GBS predictions and strategy:



Predicted number of non-magnetic CVs, intermediate polars and quiescent LMXBs in the GBS area in function of source X-ray flux

Survey upper limit:
(1-3)e-14 erg/s/cmr2

More GBS predictions:

(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)	(VIII)	(IX)	(X)
LMXB	10^{35}	Hard	0	0	140	6	7	7	7
qLMXB	10^{33}	BB	5	2	10000	120	86	221	532
UCXB	10^{34}	Hard	4	0	1000	32	3	56	58
qUCXB	10^{32}	Hard	10	0	10000	1	0	8	605
CV (non mag.)	10^{31}	Brems	7.5	0	2×10^{-5}	62	61	62	1.4×10^{6}
CV (IP)	10^{32}	Brems	8.5	0	1.5×10^{-6}	152	5	525	7.7×10^{4}
RS CVn	10^{31}	Hard	2.5	1	1×10^{-4}	596	596	596	1.3×10^{6}
W UMa	5×10^{30}	Hard	4.5	2	7.5×10^{-5}	160	160	160	2.3×10^{6}
Be X-ray binaries	10^{34}	Hard	0	0	500	9	9	10	10
Total						1142		1648	

I: Source Type.

II: Lx (eg/s)

III: X-ray color

IV: i-band absolute mag

V: (I-K)o

VI: space density

VII: GBS sources with X-ray + optical counterparts.

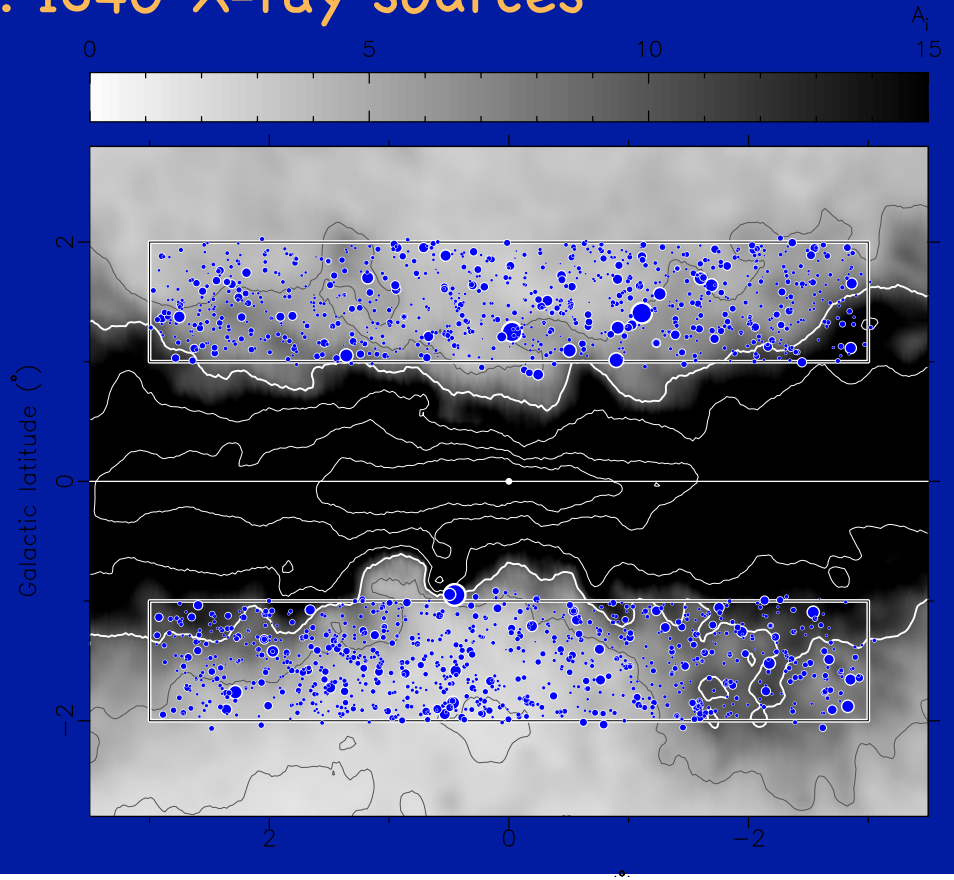
VIII: sources with X-ray + K-band counterparts.

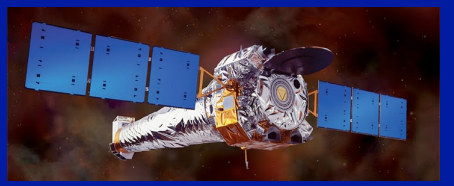
XIX: sources with X-ray counterpart only

A multi-wavelength project!

- X-ray survey sensitive to faint sources and excellent position accuracy.

  Complete in 2012. 1640 X-ray sources





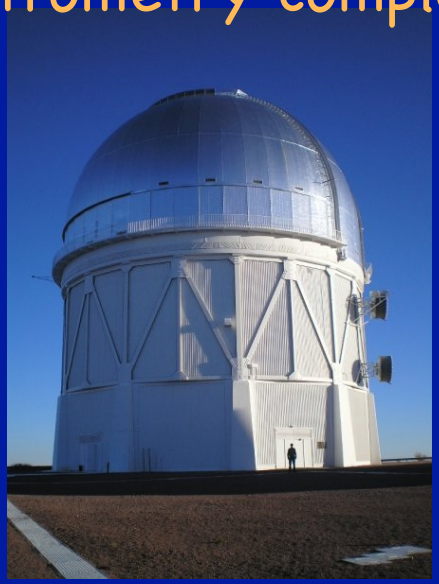
A multi-wavelength project!

- X-ray survey sensitive to faint sources and excellent position accuracy.

  Complete in 2012. 1640 X-ray sources.

- Optical (Blanco) and infrared (VVV) PHOTOMETRIC survey.

  Observations and astrometry complete. Absolute calibration on-going.



A multi-wavelength project!

- X-ray survey sensitive to faint sources and excellent position accuracy.

  Complete in 2012. 1640 X-ray sources.

- Optical (Blanco) and infrared (VVV) PHOTOMETRIC survey.

  Observations and astrometry complete. Absolute calibration on-going.

- Optical SPECTROSCOPIC survey.

  On-going: VIMOS, FORS, X-SHOOTER (VLT), EFOSC2 (NTT), GMOS (Gemini), Goodman (SOAR)

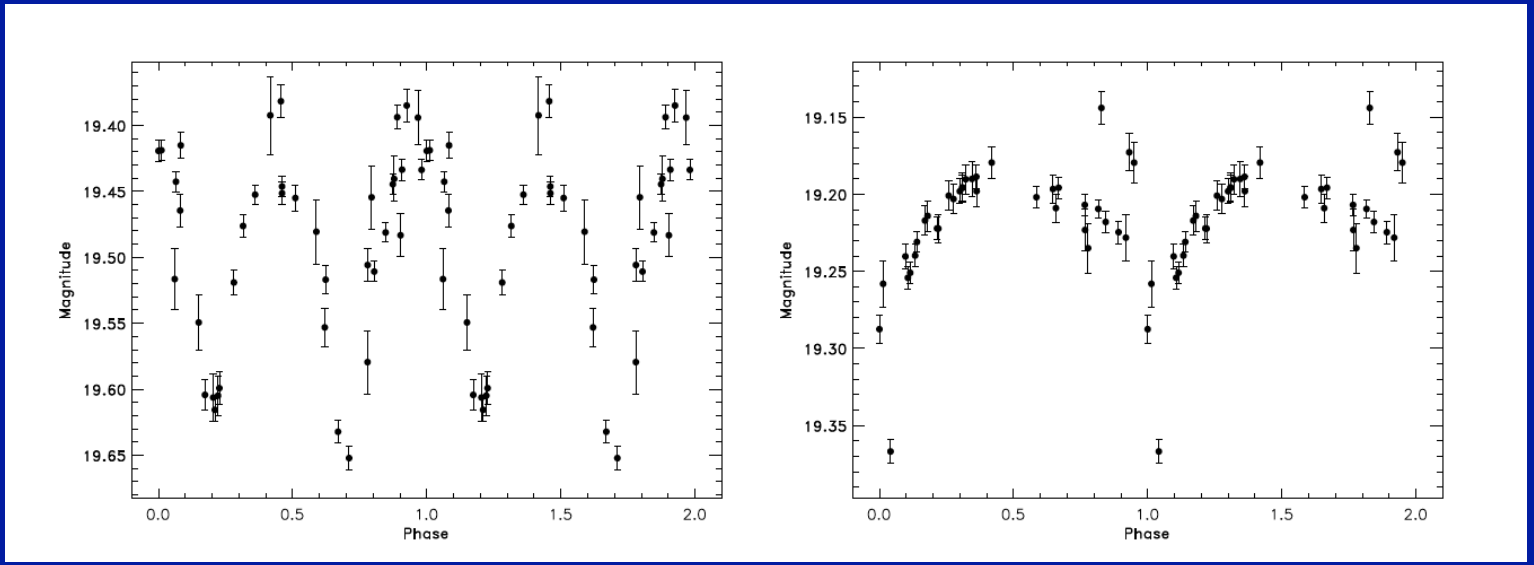
- UV Coverage with GALEX. Complete 2011.

- Radio coverage with EVLA. Approved 2012.

A variability project!

- Optical (Blanco) and infrared (VVV) VARIABILITY survey.

  Optical complete. Analysis on-going. More than 120 optical variables.



- X-ray and UV VARIABILITY with Swift.

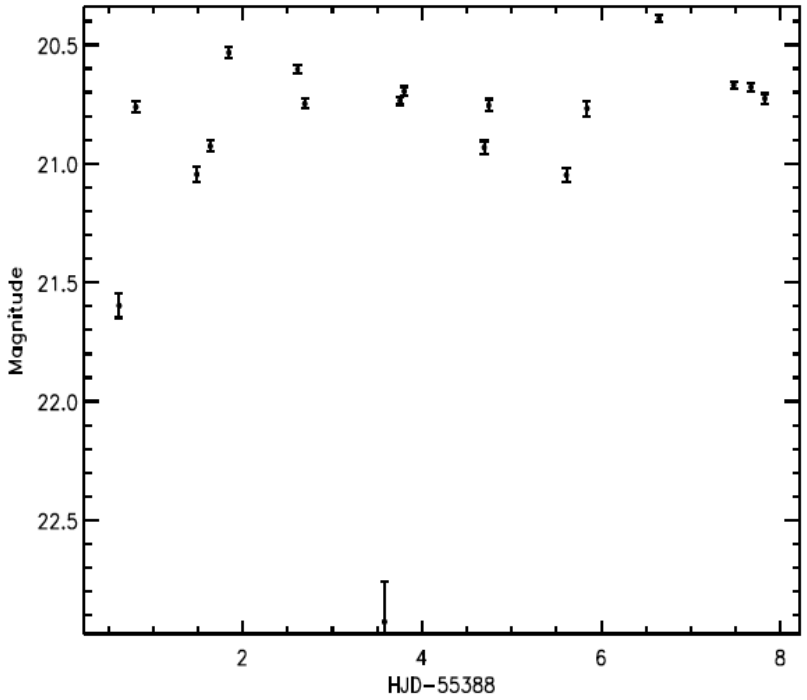
  Finished.

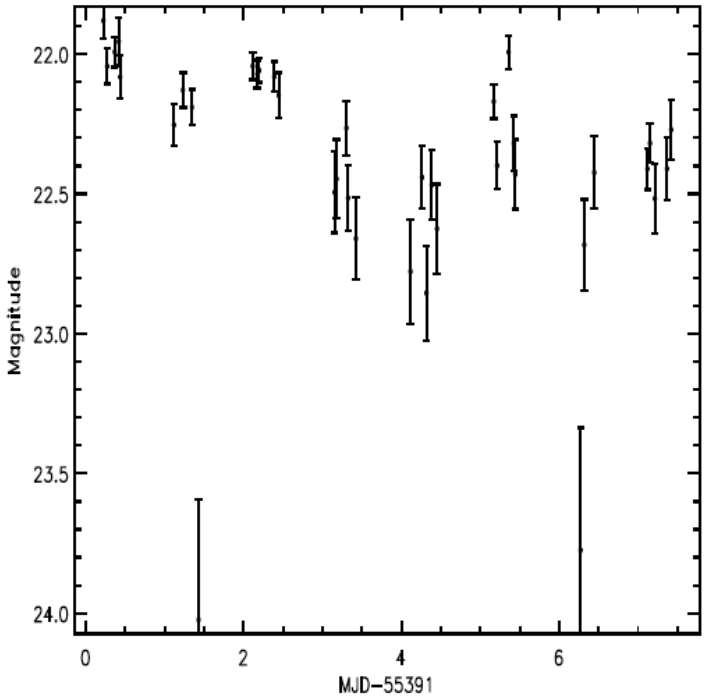
First results from shallow public surveys:

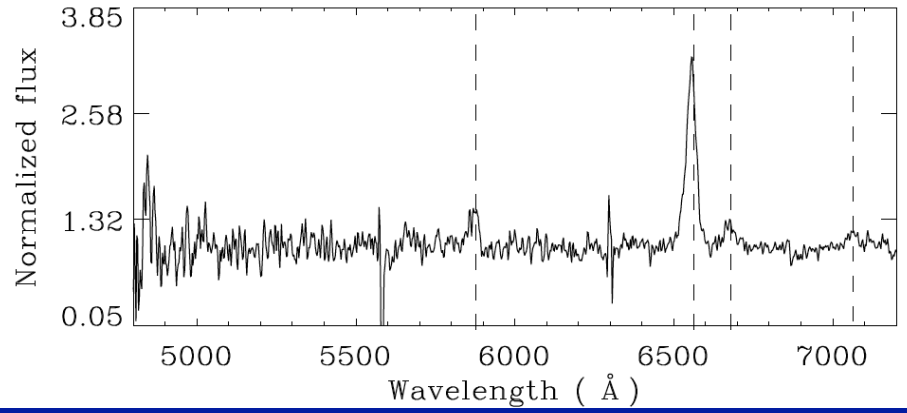
- Identification of radio counterparts in the NVSS catalogue: 12 sources.
- Tycho-2 counterparts + ASAS variability: 60
- Optical Gravitational Lensing Experiment (OGLE) variables: 209

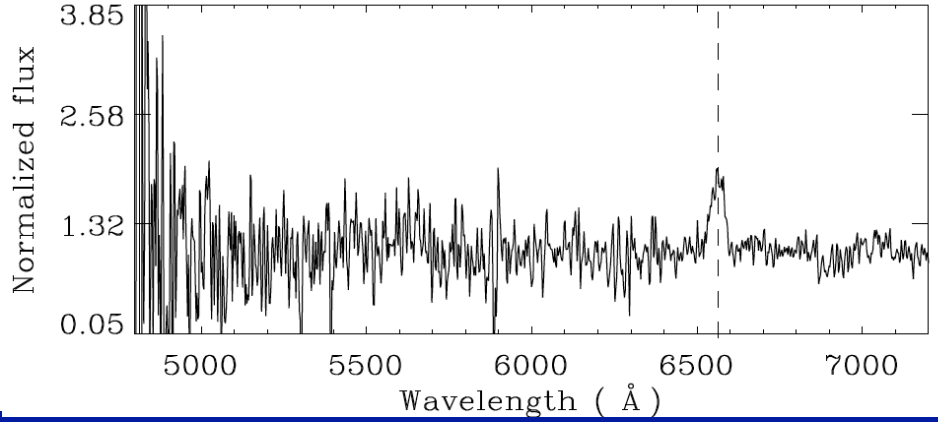
First results from optical spectroscopy:

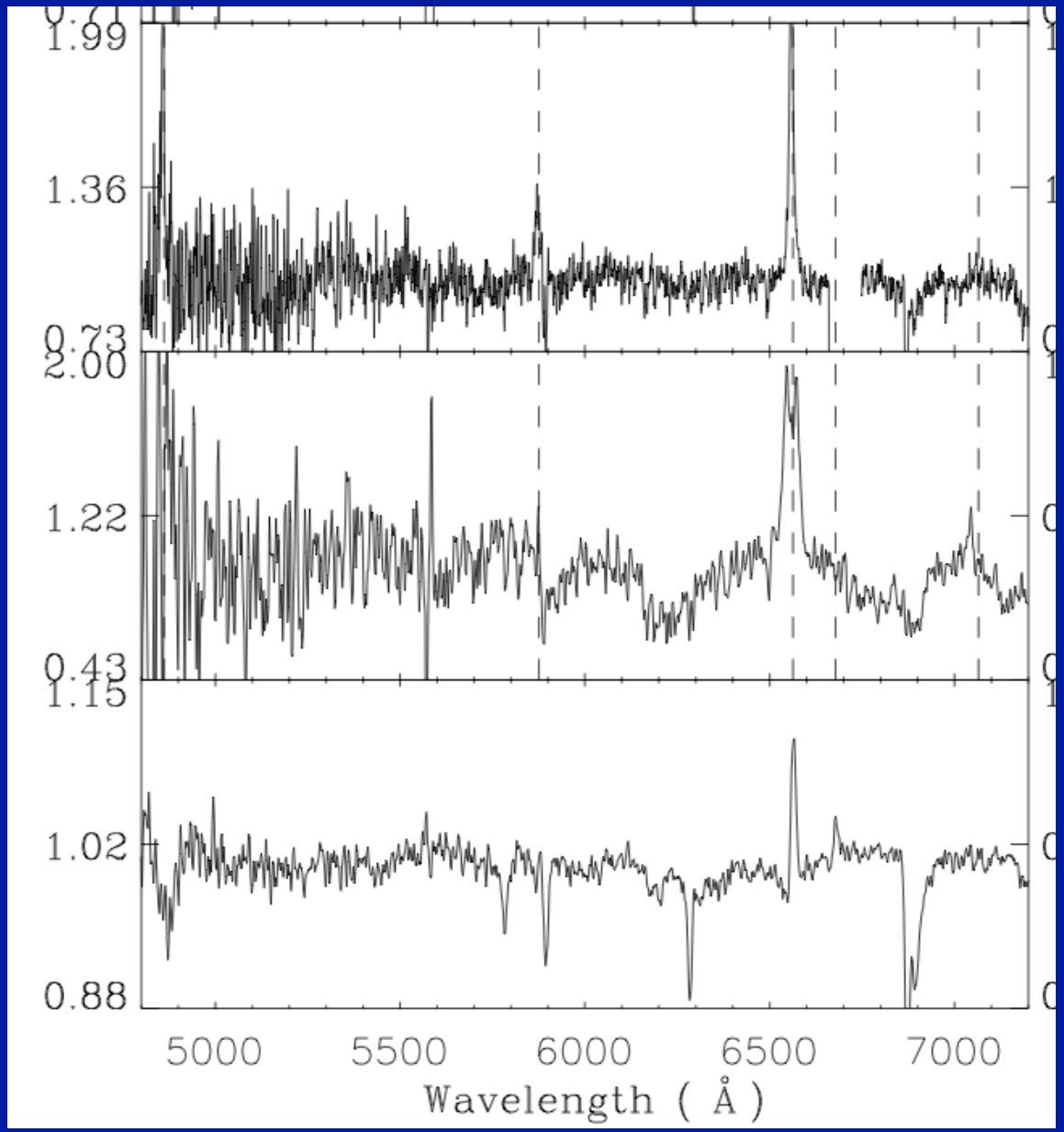
- 30 secure accreting X-ray binaries. Around 70 Halpha emitting sources.
- First dynamical study. Confirmed CV.

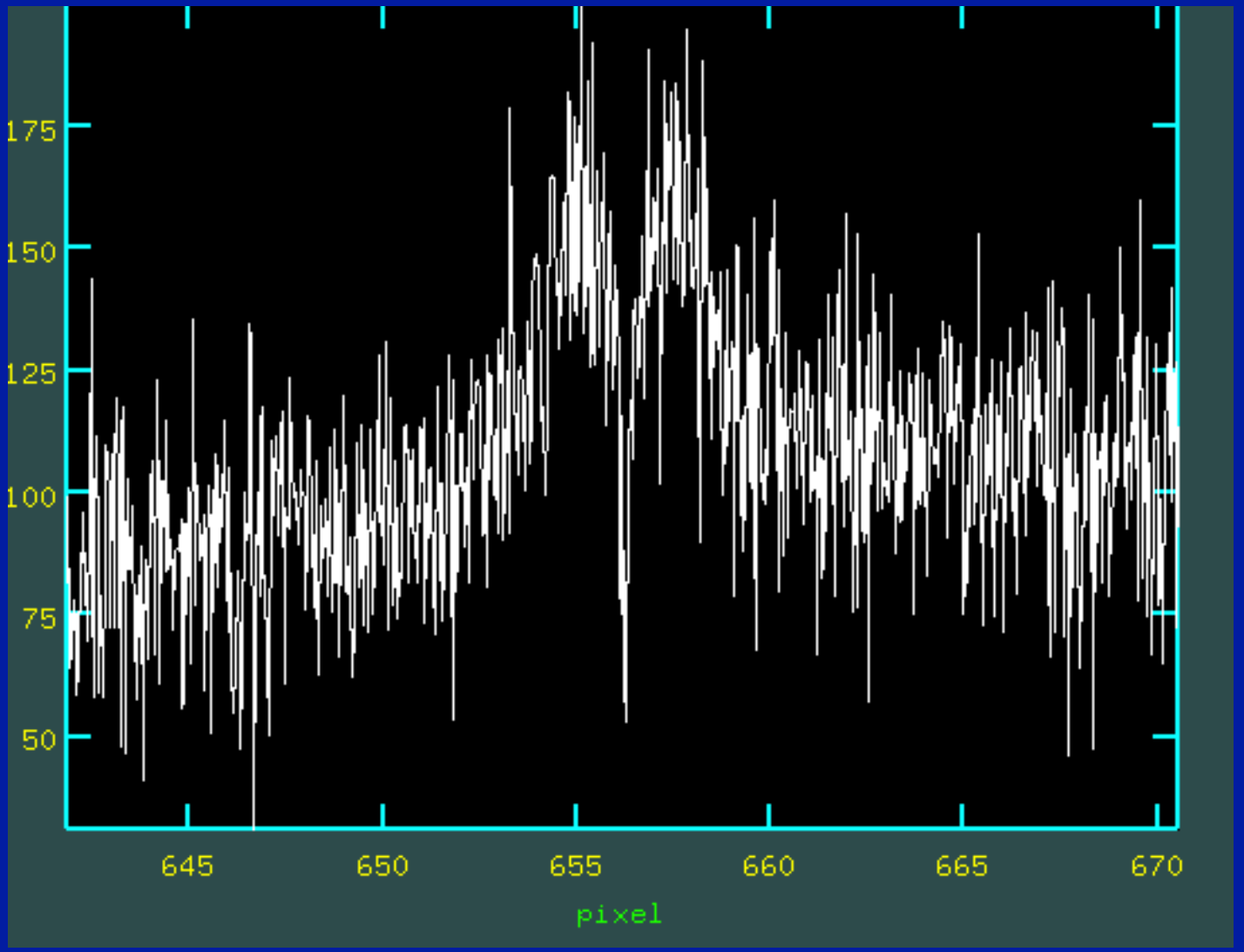

Magnitude
20.5
21.0
21.5
22.0
22.5
2
4
6
8
HJD−55388


Magnitude
22.0
22.5
23.0
23.5
24.0
0
2
4
6
MJD−55391

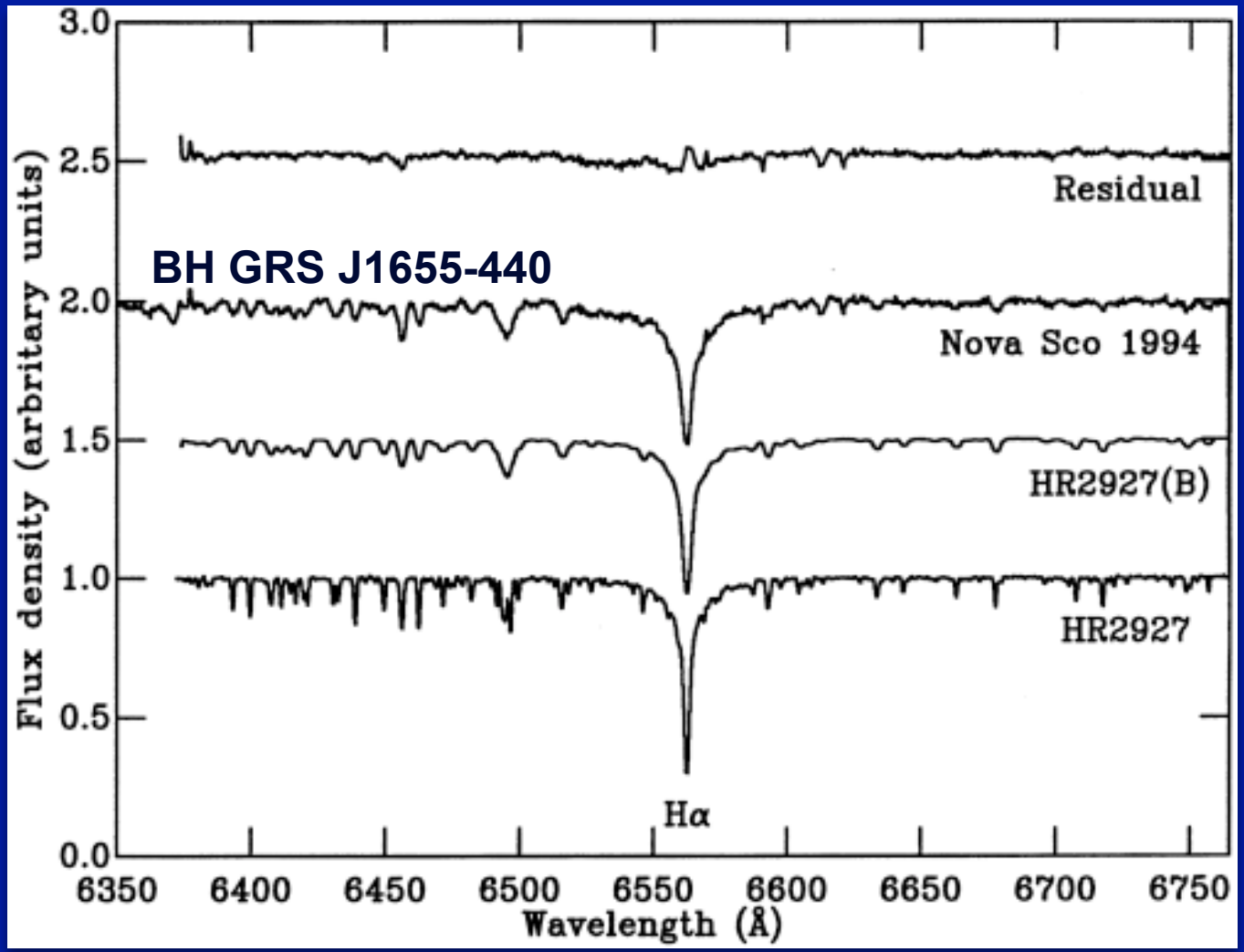

Normalized flux
3.85
2.58
1.32
0.05
5000
5500
6000
6500
7000
Wavelength (Å)


Normalized flux
3.85
2.58
1.32
0.05
5000
5500
6000
6500
7000
Wavelength (Å)

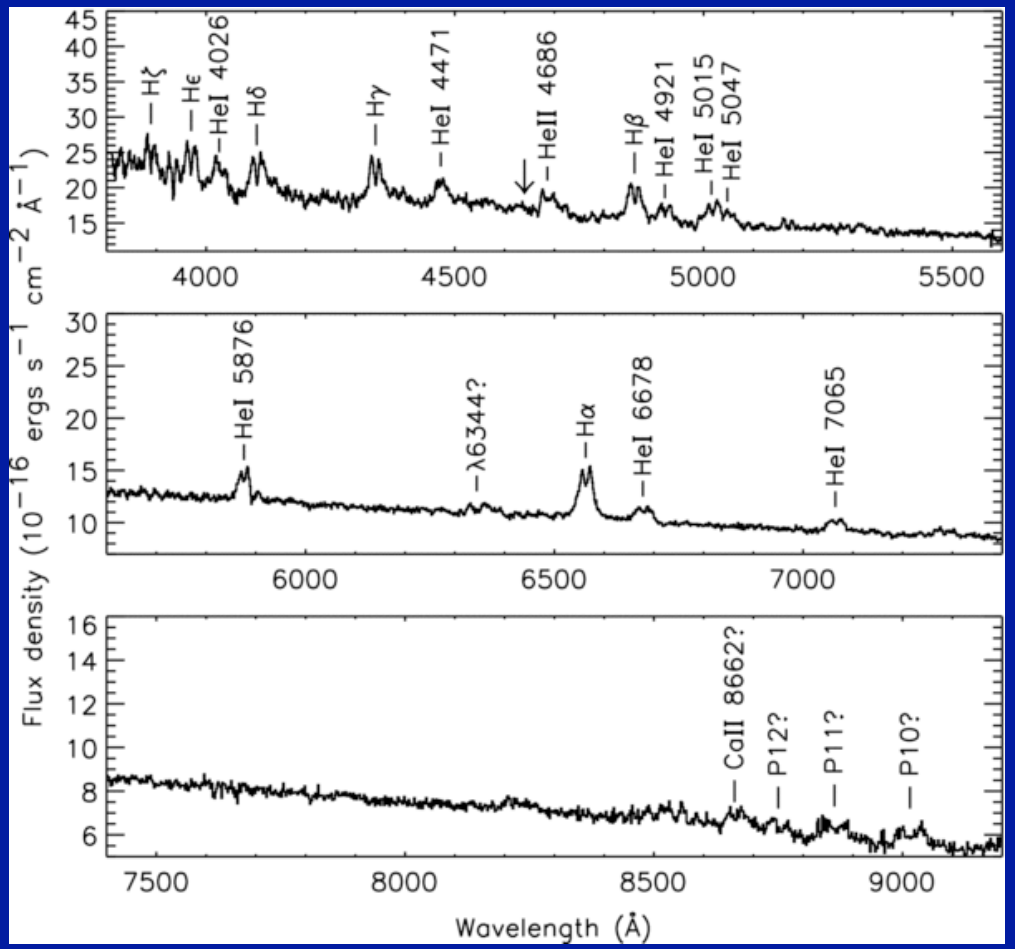

1.99
1.36
0.73
2.00
1.22
0.43
1.15
1.02
0.88
5000
5500
6000
6500
7000
Wavelength (Å)


175
150
125
100
75
50
645
650
655
660
665
670
pixel

IS IT ALL ABOUT EMISSION LINE OBJECTS?


BH GRS J1655-440
Residual
Nova Sco 1994
HR2927(B)
HR2927
Hα
Flux density (arbritary units)
Wavelength (Å)
3.0
2.5
2.0
1.5
1.0
0.5
0.0
6350
6400
6450
6500
6550
6600
6650
6700
6750

SDSS J102347.6+003841



SDSS J102347.6+003841