

Deep optical surveys in search for accreting compact binaries

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Outline

- Accreting compact objects
- Galactic Plane Surveys
- *Kepler*-INT Survey (KIS)

Accreting objects

Many types: CVs, LMXBs, HMXBs, AM CVns, RS CVns, Be+NS, Symbiotic stars, ...

But why are they interesting?

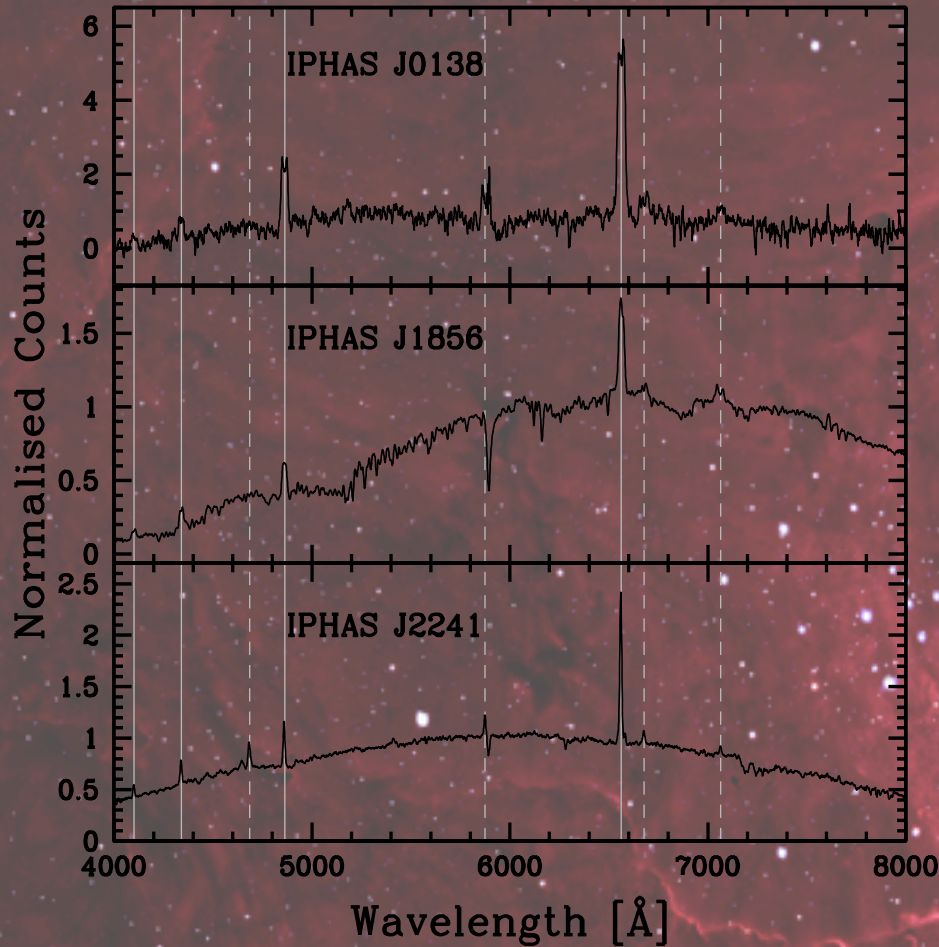
And how will we find them?

IPHAS, UVEX, VPHAS+

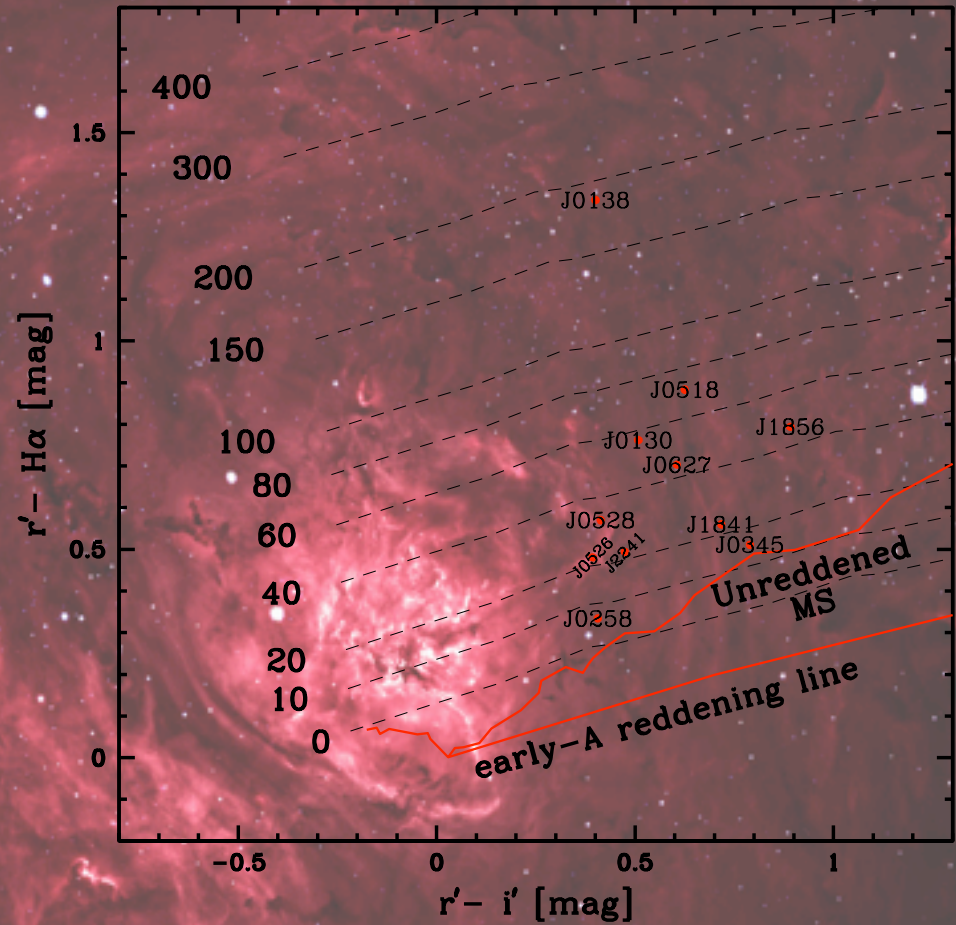
- North Galactic Plane: IPHAS and UVEX
 - Southern plane and Galactic Bulge: VPHAS+
 - Filters used: U, g, r, i and H α
 - Depth: 21st – 22nd magnitude (Vega system)
- } 3800 deg²

IPHAS CVs

(Witham et al., 2007, MNRAS, 382, 1158)



ID spectra of three new CV candidates identified by Hectospec



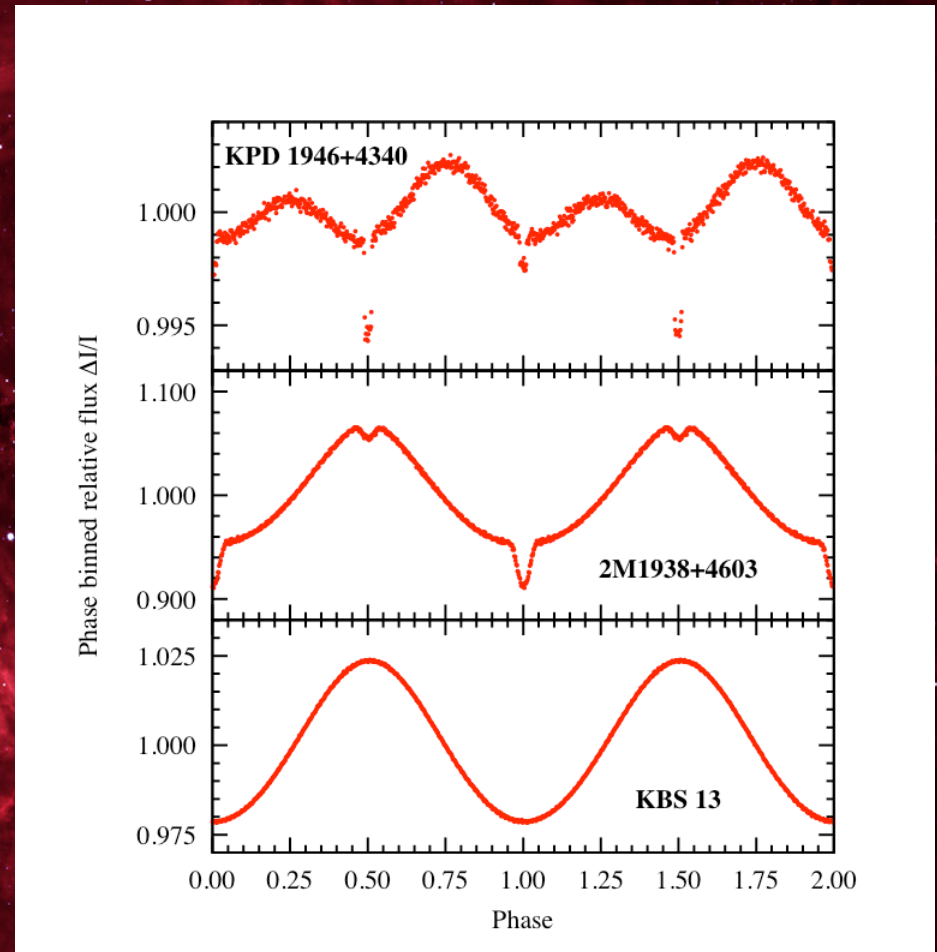
IPHAS colour-colour plot showing the location of the 11 new CV candidates

Kepler-INT Survey (KIS)

- *Kepler* mission:
Unprecedented time-series photometry BUT field lacks optical photometry



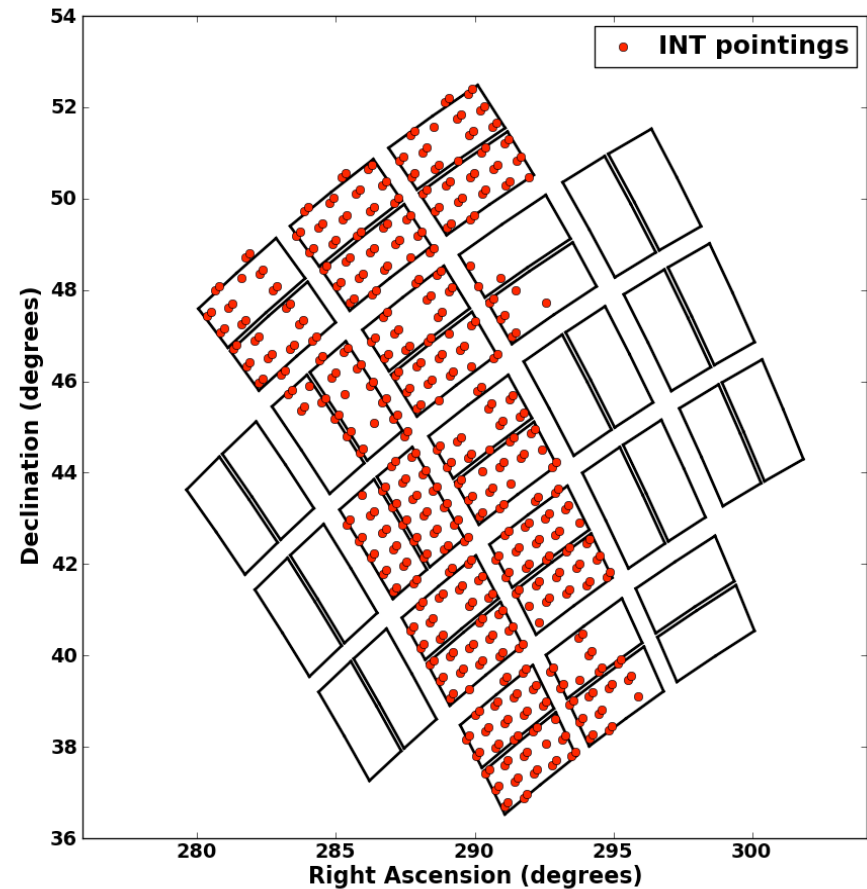
KIS



Light curves of three binary sdB stars (Ostensen et al. 2010, MNRAS, 409, 1470).

Kepler-INT Survey (KIS)

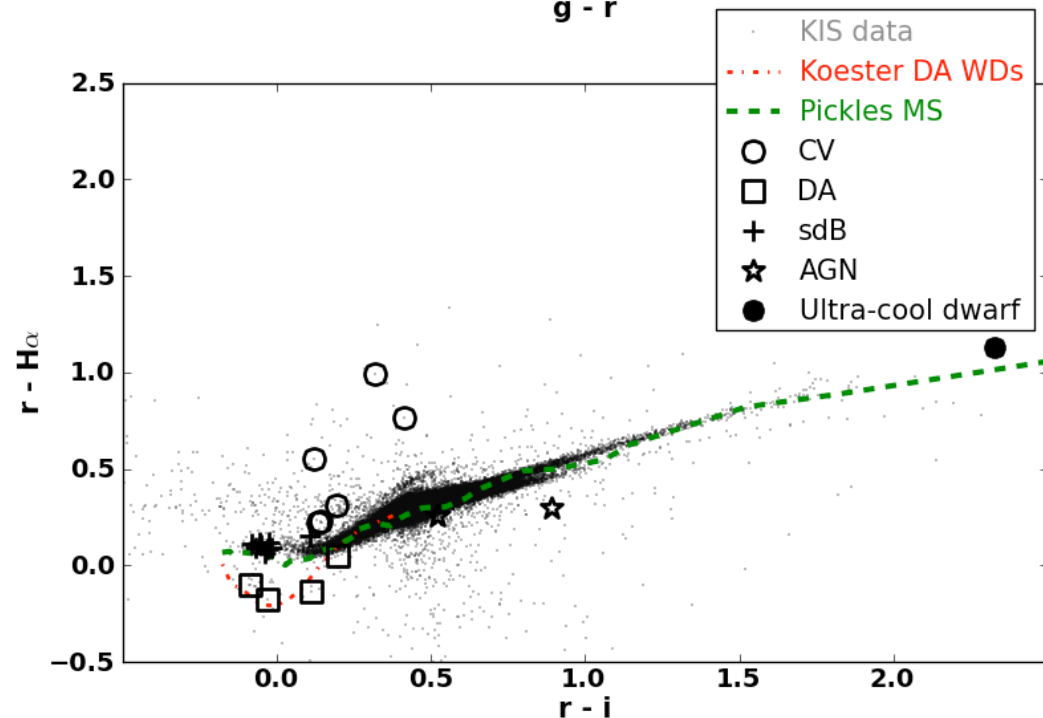
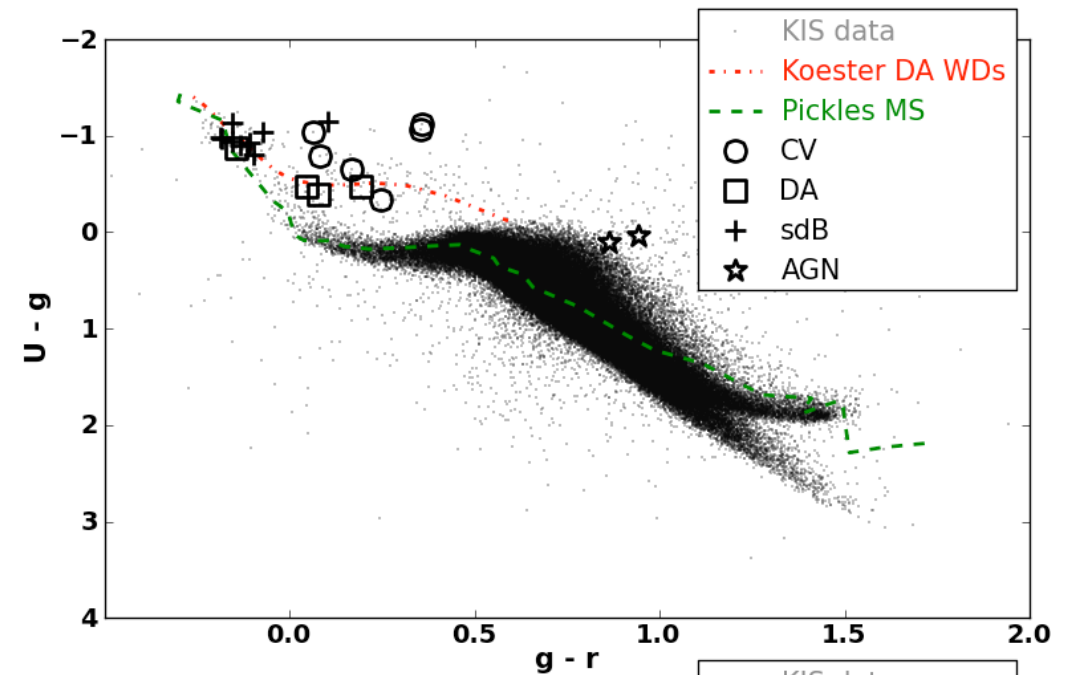
- KIS (Greiss et al. 2012, ArXiv: 1202.6333):
 - 116 deg²
 - U, g, r, i and H α
 - IDR catalogue:
 - 6 million detected objects (50% covered)
 - Depth ~ 20th mag



Colour-colour diagrams showing loci of different stellar objects in colour-space

- Pickles MS colours taken from Drew et al. (2005, MNRAS, 362, 753) and Groot et al. (2009, MNRAS, 399, 323).
- Koester DA WD colours taken from Verbeek et al. (2012, MNRAS, 420, 1115)

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Conclusion

- Astronomical surveys have enabled automated searches of a large number of exotic sources by the use of colour-colour diagrams
- KIS data:

www.astro.warwick.ac.uk/research/kis/