

The H α photometric surveys of the galactic plane: IPHAS and VPHAS+

Juan Fabregat

Observatorio Astronómico de la Universidad de Valencia

IVICFA miniWorkshop, Valencia, October 19, 2012



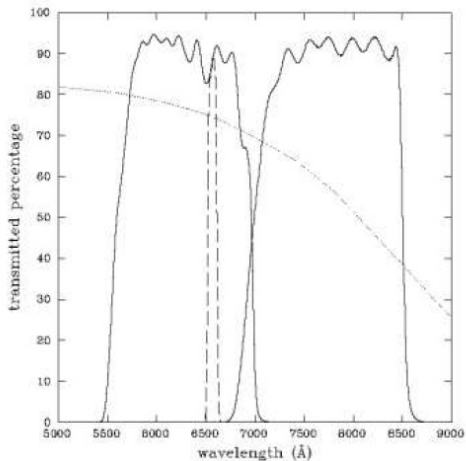
The IPHAS photometric survey

IPHAS: The INT/WFC Photometric $H\alpha$ Survey of the Northern Galactic Plane

- Photometric survey in $H\alpha$, r' and i' filters
- Extended to the northern galactic plane, $5 > b > -5$ (1800 sq. deg.)
- Magnitude range $13 < r' < 20$
- Observations started in 2003, and are almost completed by now

IPHAS home: <http://www.iphas.org>

The IPHAS filters bandpasses



IPHAS, Centre for Astrophysics Research (University of Hertfordshire)

http://www.iphas.org/

University of Hertfordshire

THE INT PHOTOMETRIC Ha SURVEY
IPHAS
OF THE NORTHERN GALACTIC PLANE

IPHAS Home | Collaboration & Contact | IPHAS Data | Observing Programme | Consortium Area | Gallery | Current Survey Status | Publications

IPHAS: The INT/WFC Photometric Ha Survey of the Northern Galactic Plane

IPHAS is a survey of the Northern Galactic Plane being carried out, in $H\alpha$, r and I filters, with the Wide Field Camera (WFC) on the 2.5-metre Isaac Newton Telescope (INT). In the north, IPHAS is being followed by UVEX, a blue-optical INT/WFC survey collecting data in U, g and H α 5876. In the south, a closely-related approved public survey, VPHAS⁺ began collecting survey pointings on the VLT Survey Telescope (VST) using Omega-Sha, in January 2012. Together, these surveys provide a springboard to a quantitative revolution in our understanding of the extreme phases of stellar evolution. The previous generation of $H\alpha$ surveys of the Galaxy, conducted over 30 years ago, begin to be incomplete even at $m_V=12$ - the new generation extends this limit down to red magnitudes fainter than 20.

Publications arising from the IPHAS survey are being posted [here](#).

News

Last update: 25/02/2012

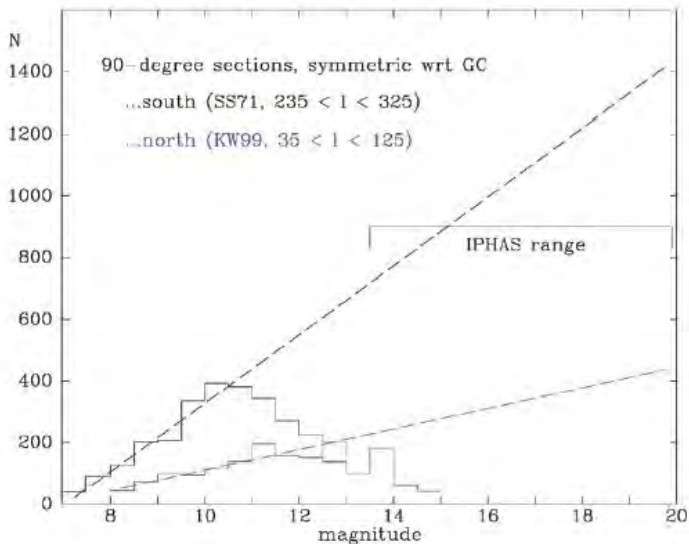
FINAL REPLACEMENT FIELDS: Plans are being laid to collect these. The data from around 5 percent of the survey footprint are clearly so weather-affected that they need to be replaced. These are mostly in the winter/Anticentre part of the Galactic Plane.

IPHAS UNIFORM CALIBRATION: This is being readied for publication along with the next data release of over 90 percent of the survey area. It has been brought to a common photometric scale, of comparable precision to that of 2MASS, at around 0.02-0.03 magnitudes.

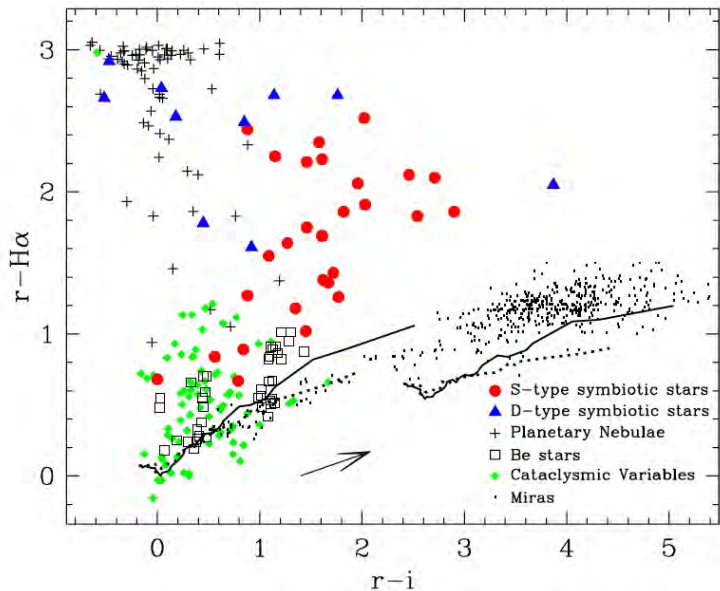
IPHAS - END OF MAIN DATA-TAKING By the end of 2008, every survey field had been observed at least once, if not necessarily in good weather. The project is now in a phase of upgrading as many fields to the desired survey standard as weather (and allocation panels) will permit.

IPHAS INITIAL DATA RELEASE: The IDR became publicly accessible in December 2007. All data taken up to the beginning of 2006 were uploaded at that time and can be accessed via AstroGrid and via a cone-search tool and image thumbnail server (constructed at IoA Cambridge by Nic Walton and Eduardo Gonzalez-Solares, see [Gonzalez-Solares et al 2008](#)). The presently-released data are calibrated at the individual field level. The IDR can be accessed via the [Early IPHAS Data](#) page.

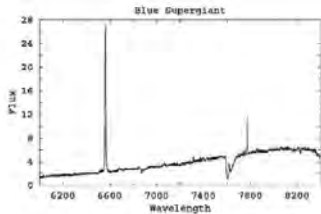
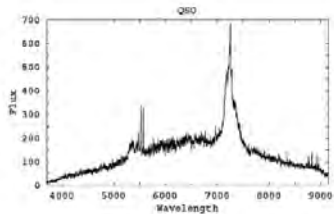
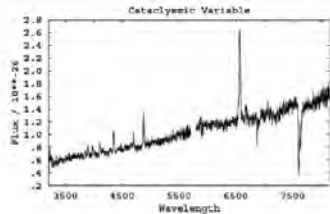
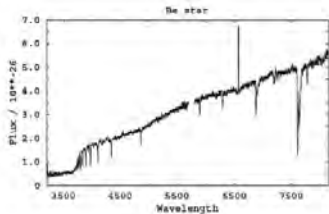
Estimation of emission line stars numbers



The IPHAS colour-colour diagram



Spectroscopic follow-up



The IPHAS collaboration (P.I. Janet Drew, UK)

(alphabetically, by institution)

Armagh Observatory, Northern Ireland: Jorick Vink

Bristol University: Steve Phillipps, Rhys Morris

Harvard-Smithsonian Center for Astrophysics (USA): Jeremy Drake, Danny Steeghs

Imperial College London: Yvonne Unruh

Institute of Astronomy (CASU), Cambridge: Mike Irwin, Nic Walton, Eduardo Gonzalez-Solares

Instituto de Astrofisica de Canarias (Spain) : Romano Corradi, Antonio Mampaso, Eduardo Martin, Pablo Rodriguez-Gil

Isaac Newton Group: Romano Corradi, Pablo Rodriguez-Gil, Ian Skillen

Macquarie University (Australia): Quentin Parker

Nijmegen University (Netherlands): Paul Groot, Luisa Morales-Rueda

Royal Observatory Edinburgh: Chris Evans

Southampton University: Christian Knigge

Space Telescope Science Institute (USA): Danny Lennon

Thueringer Landessternwarte (Germany): Jochen Eisloffel, Bringfried S tecklum

Universidad de Granada (Spain): Almudena Zurita

Universidad de Valencia (Spain): Juan Fabregat

University College London: Mike Barlow

University of Columbia (USA): Jeno Sokoloski

University of Hertfordshire: Janet Drew, Ralf Napiwotzki

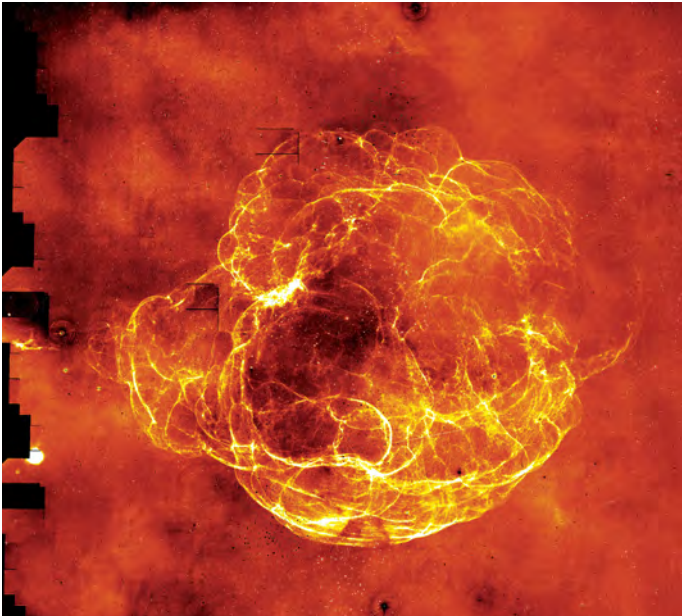
University of Manchester: Albert Zijlstra

Warwick University: Boris Gaensicke, Danny Steeghs

- Initial Data Release (González-Solares et al. 2008, MNRAS 388, 89)
 - Contains all data obtained up to the beginning of 2006
 - Photometric catalogue of ~ 200 million objects, with associated image data
 - Access through traditional web server and Astrogrid VO Desktop
- Catalogue of emission line objects (Witham et al. 2008, MNRAS 384, 1277)
 - Preliminary catalogue listing photometry for nearly 5000 emission line objects
- Final data release with uniform photometric calibration expected in 2013.

IPHAS images: Rosette nebula





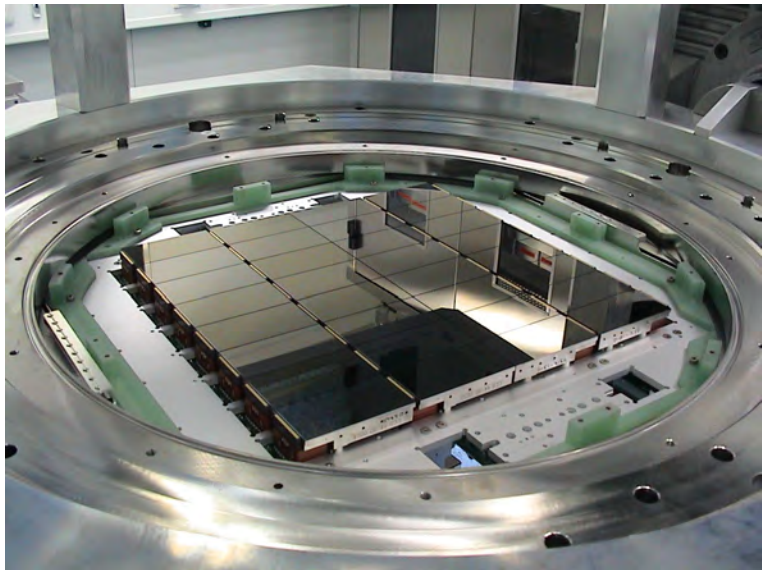
The VPHAS+ photometric survey

VPHAS: The VST/OmegaCam Photometric $H\alpha$ Survey of the Southern Galactic Plane

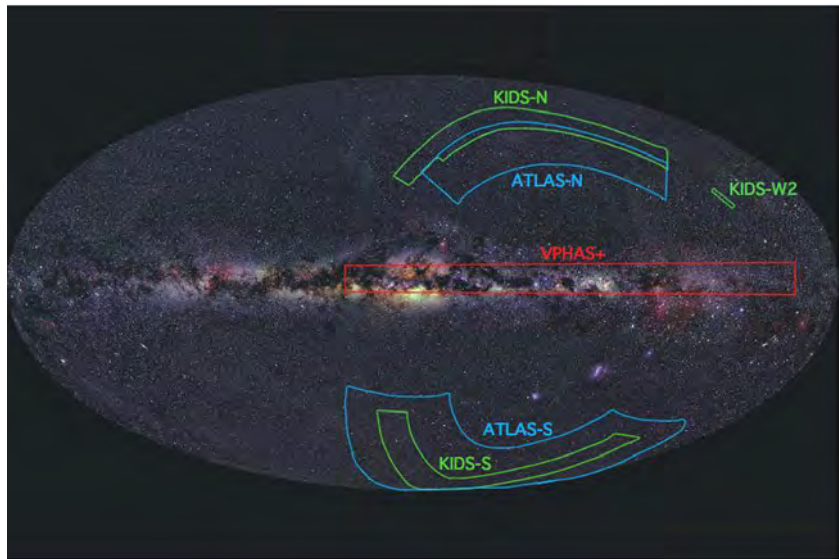
- Selected as ESO Public Survey
- Photometric survey in $H\alpha$, u' , g' , r' and i' filters
- Extended to the southern galactic plane, $5 > b > -5$ (1800 sq. deg.)
- Magnitude range $13 < r' < 21$
- Observations started in 2012

IPHAS home: <http://www.vphasplus.org>

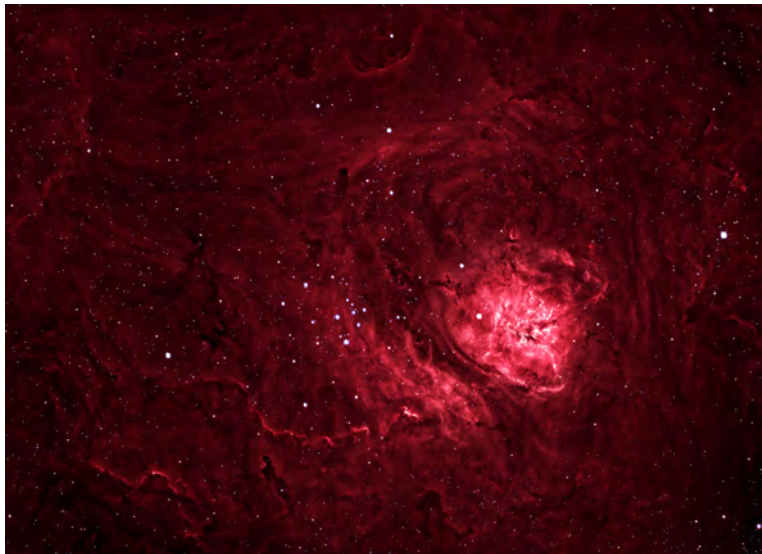
OmegaCam



VST Public Surveys



VPHAS images: Lagoon nebula



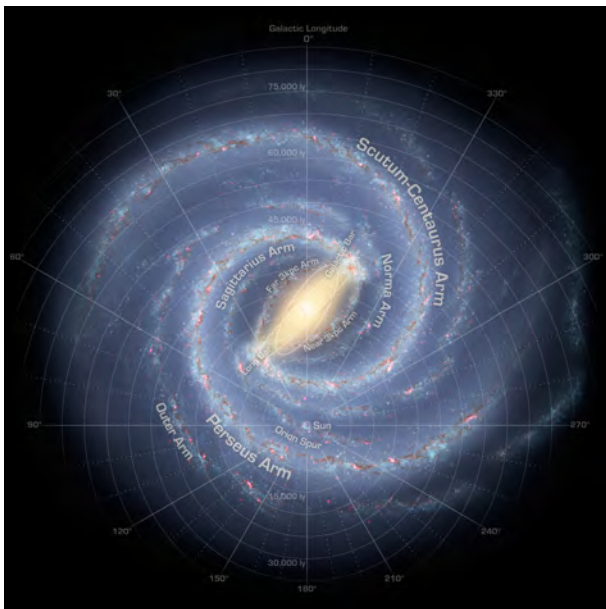
Potential for active B star research

- Most of the emission line objects detected by IPHAS are Be stars, as revealed by spectroscopic follow-up
- IPHAS will increase the number of known Be stars by several orders of magnitude
- The IPHAS limiting magnitude allows the observation of Be stars all over the Galaxy (except in regions of heavy interstellar absorption)
- With spectroscopic follow up and parallaxes Be stars can be used as tracers of the galactic structure

Be stars as galactic structure tracers



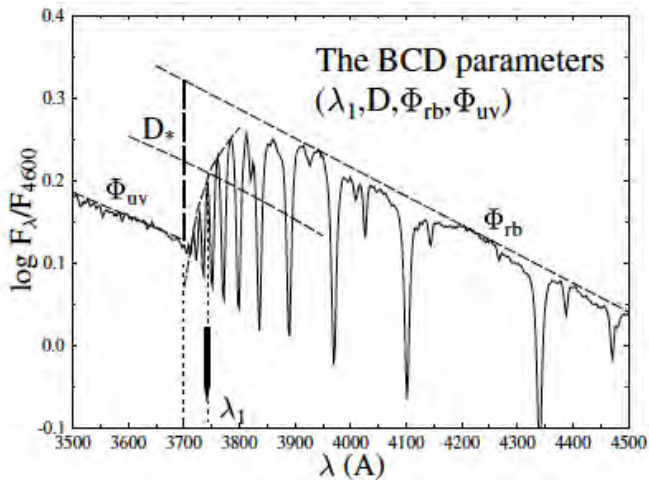
Be stars as galactic structure tracers



The BCD system

- Developed between 1930 and 1970 by Daniel Barbier, Daniel Chalonge and Lucienne Divan at the IAP, Paris (Barbier & Chalonge 1941, AnAp 4, 30; Chalonge & Divan 1952, AnAp 15, 201; 1973, A&A 23, 69; 1977, A&A 55, 117; Cidale et al 2001, A&A 368, 160; Zorec et al. 2009, A&A 501, 297)
- Bi-dimensional classification schema based on the measure of the Balmer discontinuity
 - D is a measure of the Balmer jump depth. T_{eff} indicator
 - λ_1 is a measure of the mean Balmer jump position. Luminosity indicator
- Currently in use by groups at the IAP and La Plata

The BCD system



The BCD system

