
Feeding the Giants
Ischia, 30 August 2011
Stellar Surveys at the
Australian Astronomical Observatory (AAO)
The former Anglo-Australian Observatory became a Division
of the Australian Commonwealth Department of Innovation,
Industry, Science and Research (DIISR) on 1 July 2010

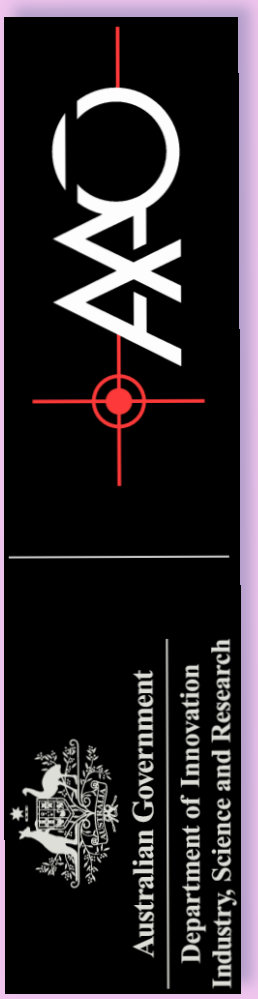

AAO North Ryde (2012)

RAVE:
A Snack For The Giants

Feeding the Giants

Ischia, 30 August 2011

Fred Watson and the
RAVE Collaboration



RAVE PI: MATTHIAS STEINMETZ, AIP

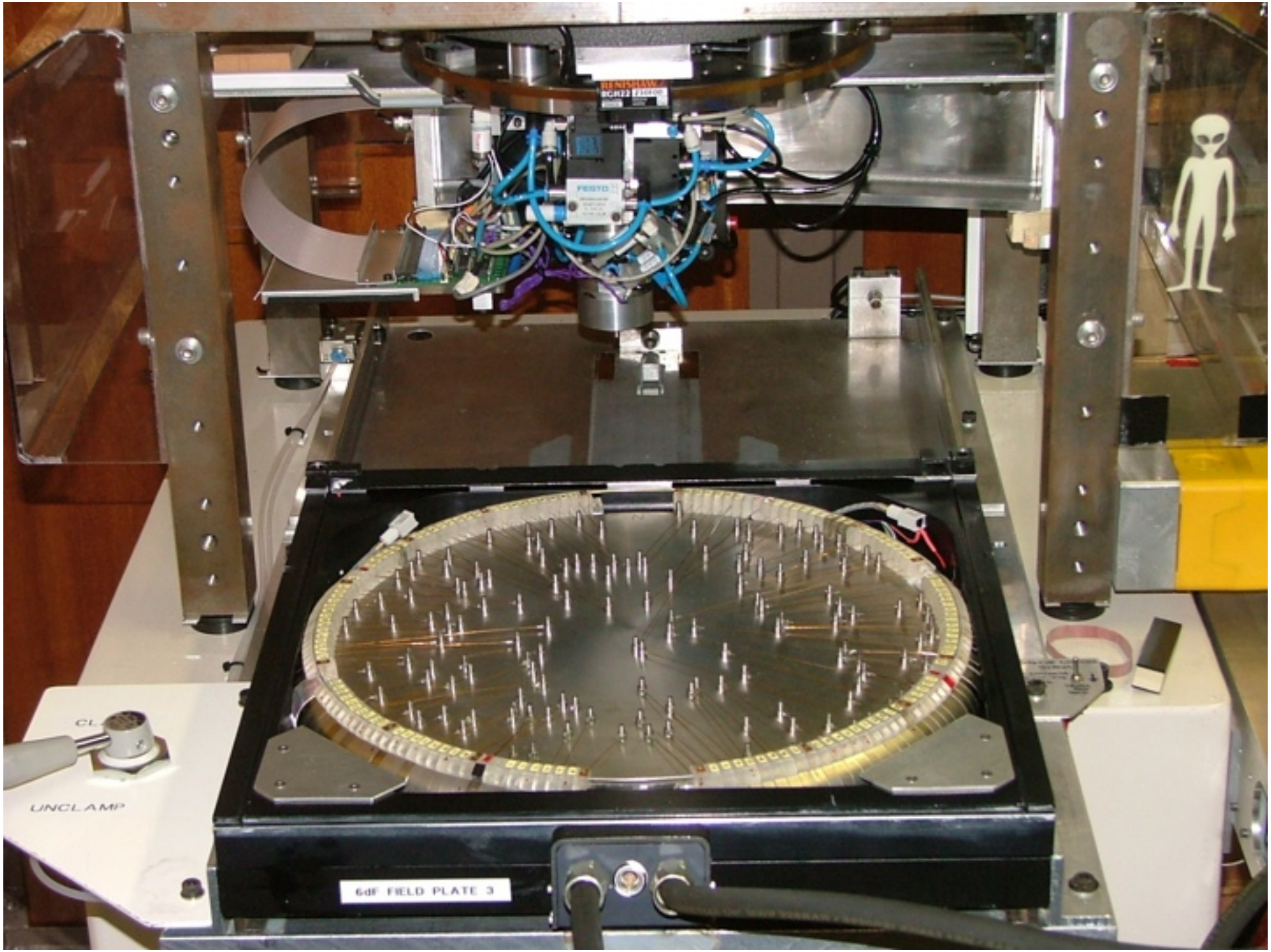
The University of Sydney

Leibniz-Institut für
Astrophysik Potsdam


RAVE...
Observations with 1.2-m UKST


RAVE...

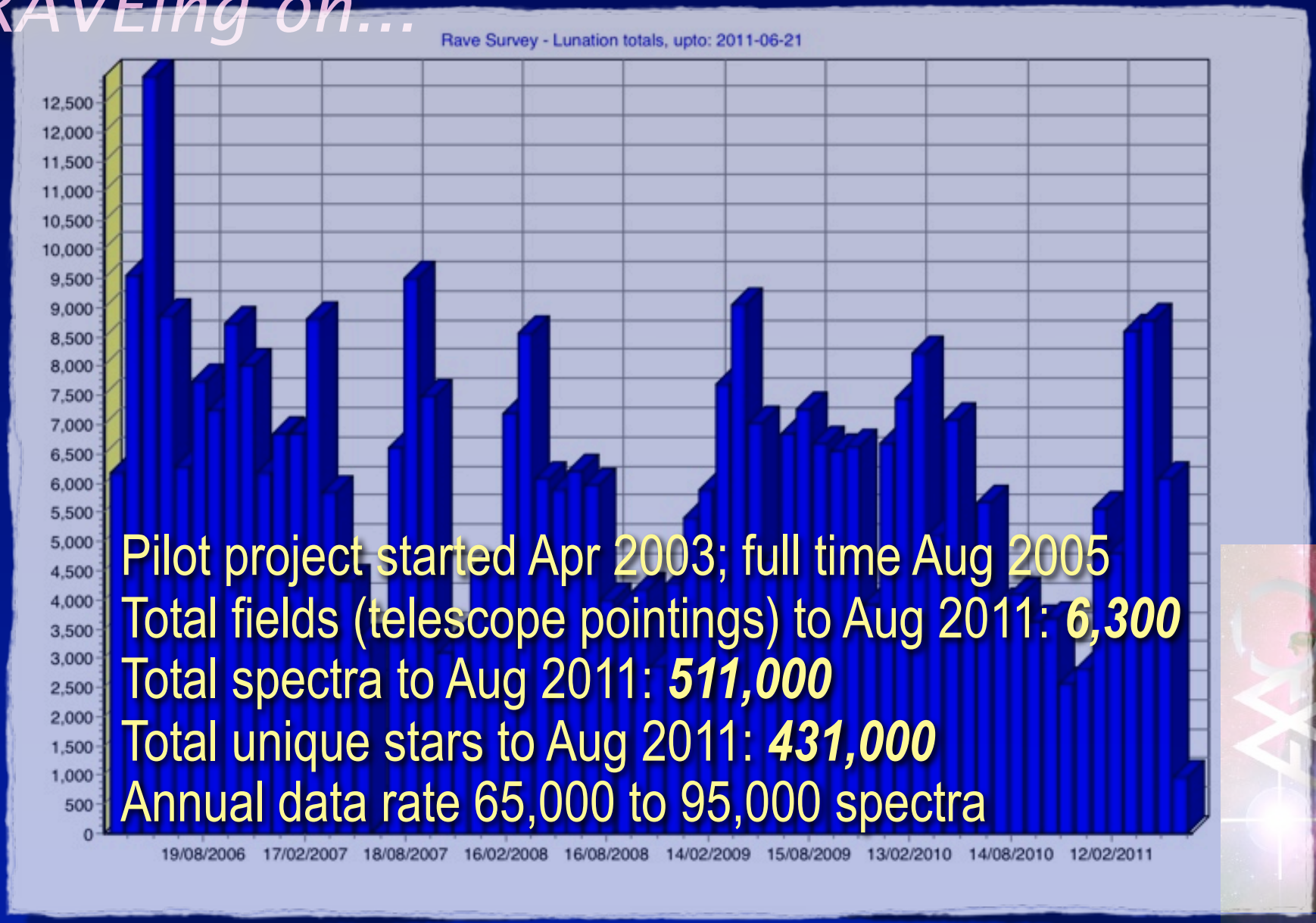

RAVE...


UNCLAMP
6dF FIELD PLATE 3

RAVE...

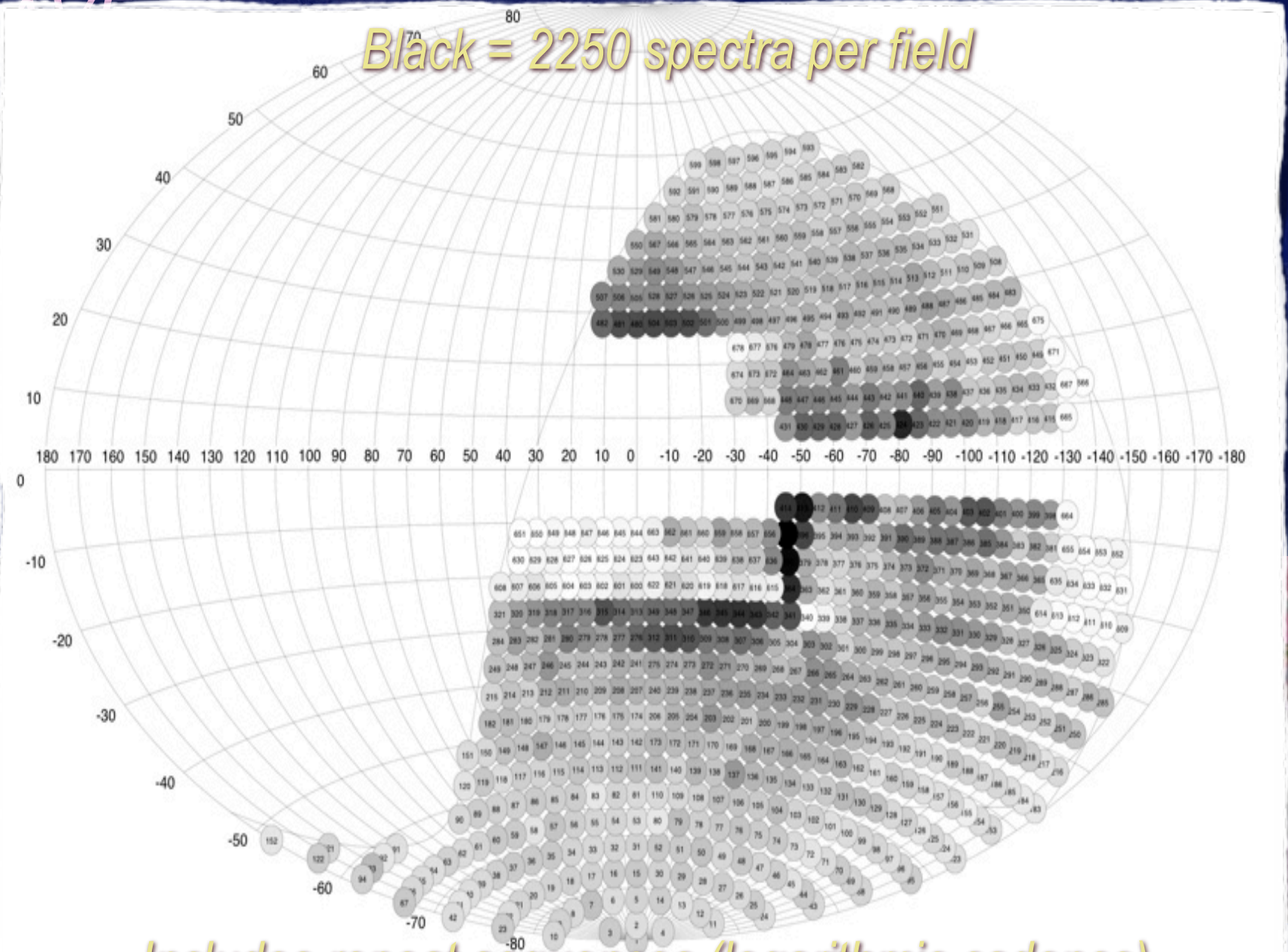
RAVE's progress

RAVEing on...

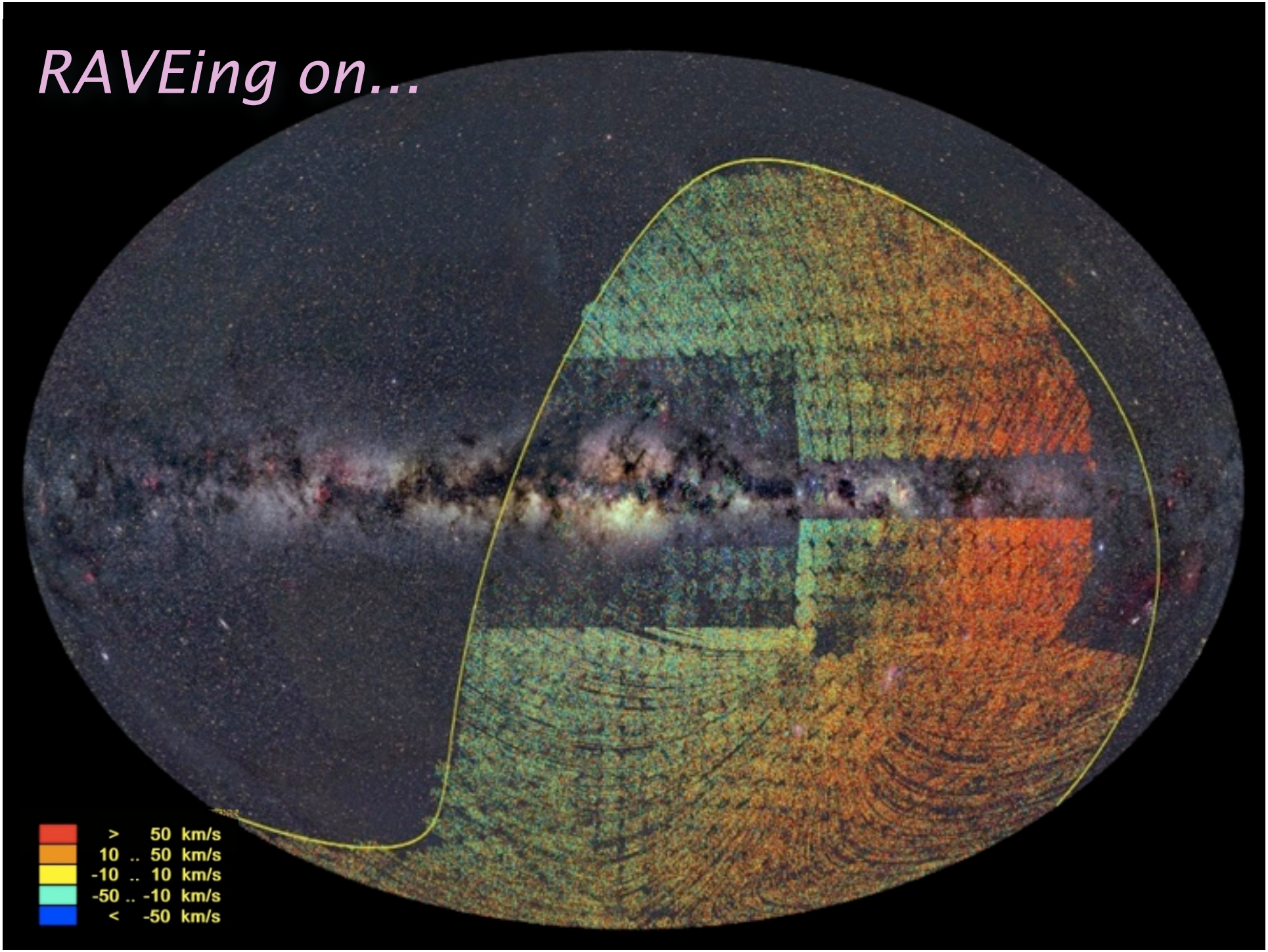


Pilot project started Apr 2003; full time Aug 2005
Total fields (telescope pointings) to Aug 2011: ***6,300***
Total spectra to Aug 2011: ***511,000***
Total unique stars to Aug 2011: ***431,000***
Annual data rate 65,000 to 95,000 spectra

RAVE

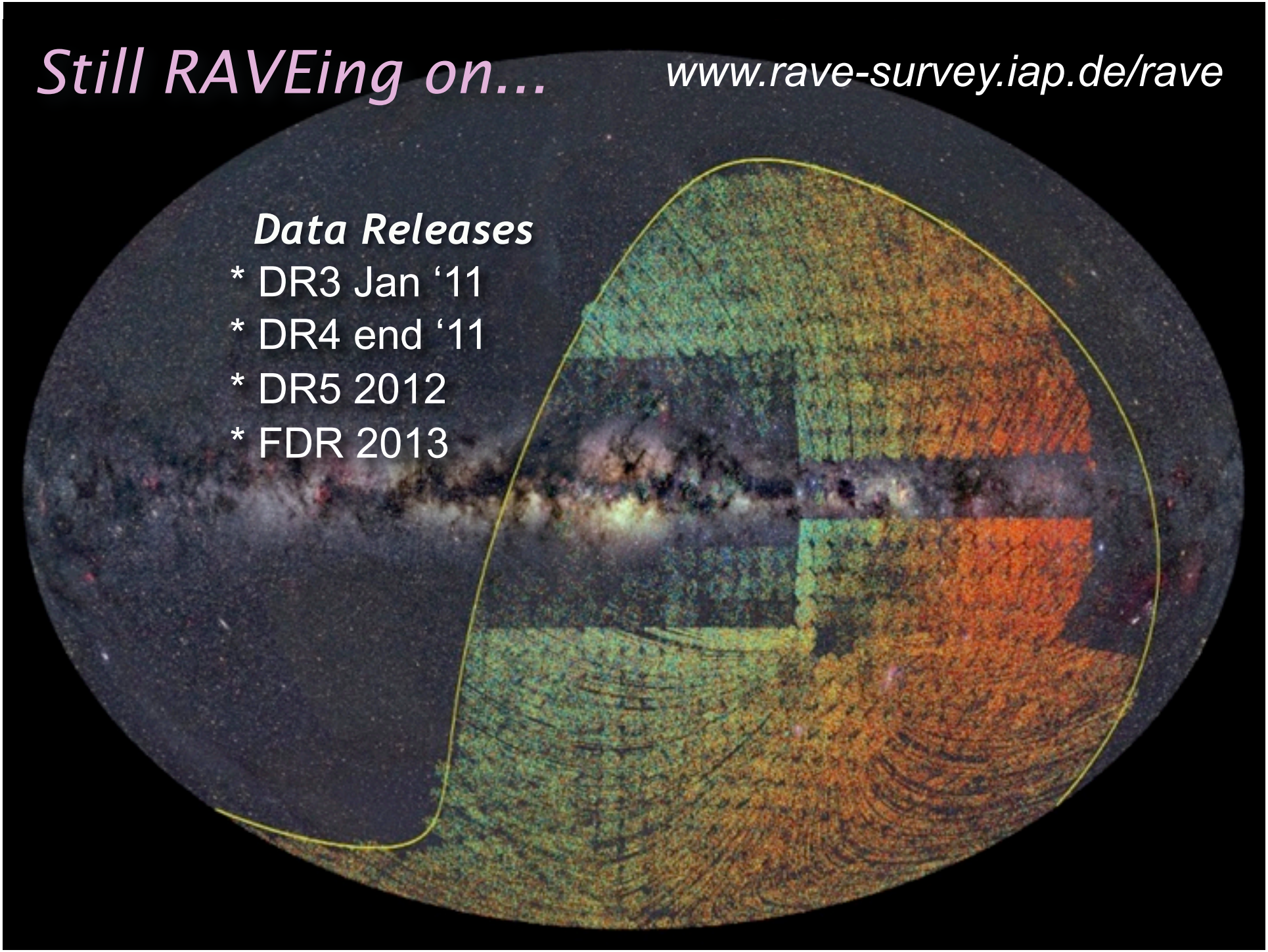

Black = 2250 spectra per field
Includes repeat sequences (logarithmic cadence)

RAVEing on...



Still RAVEing on...

www.rave-survey.iap.de/rave



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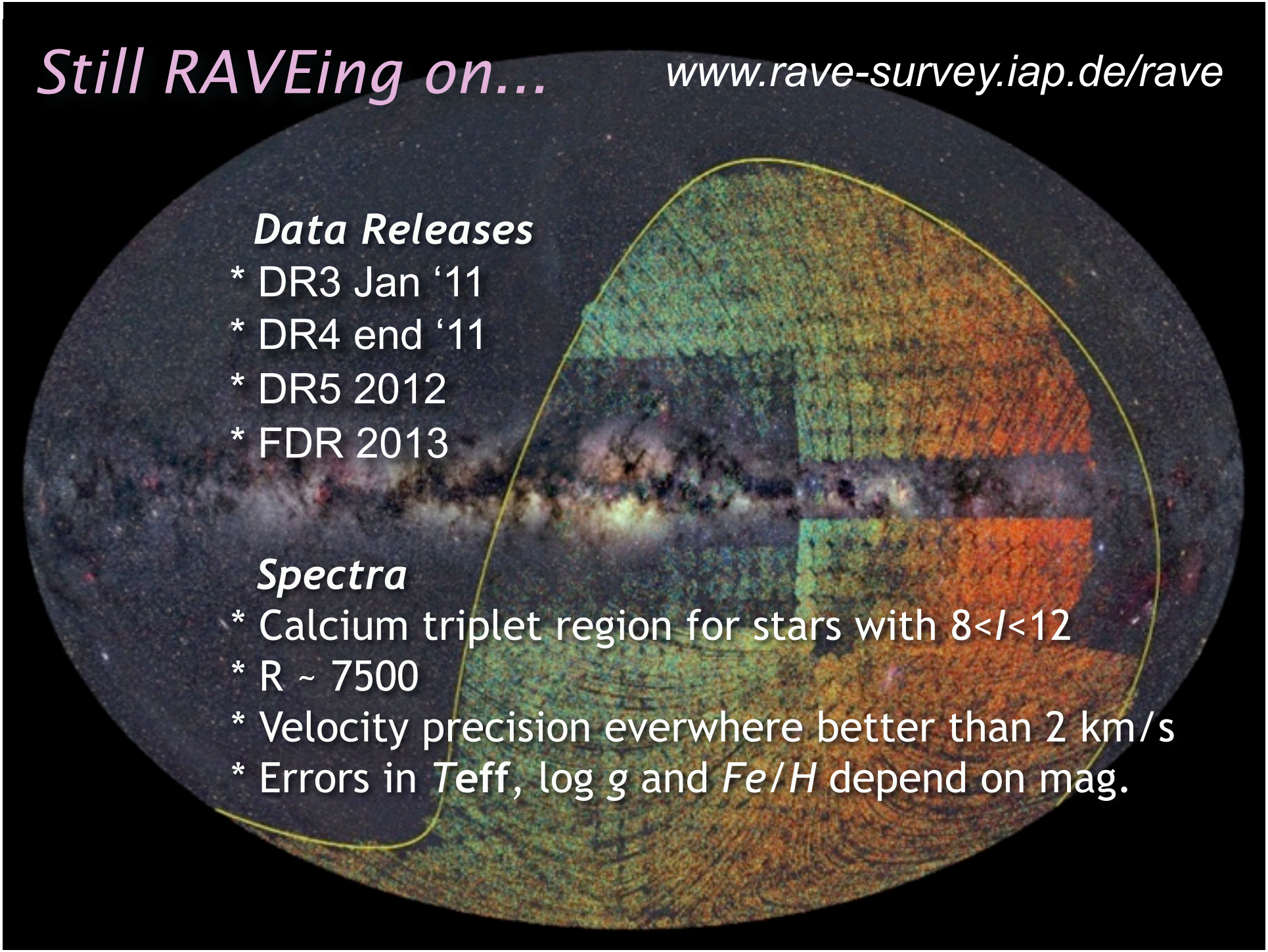


Data Releases

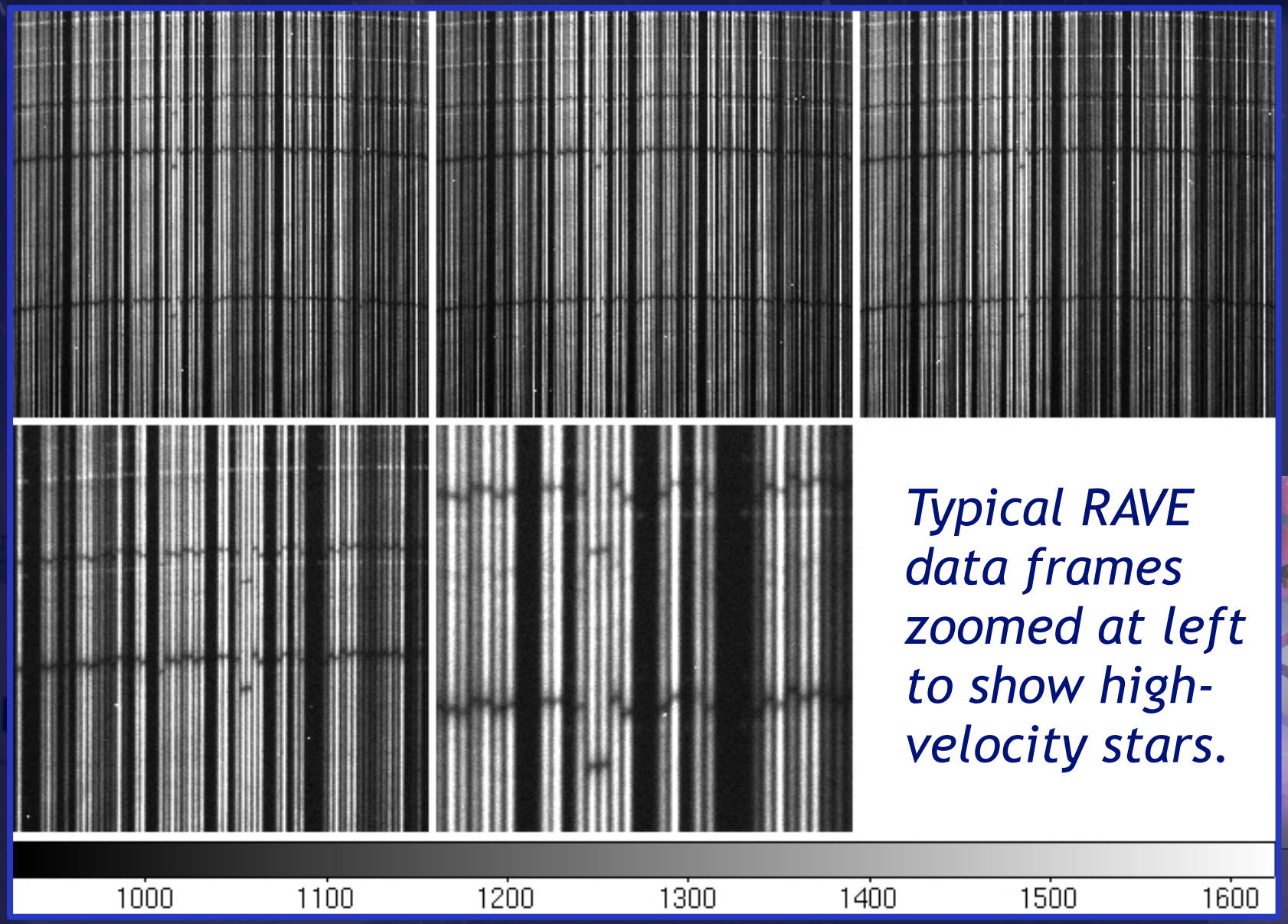
* DR3 Jan '11
* DR4 end '11
* DR5 2012
* FDR 2013

Spectra

* Calcium triplet region for stars with $8<I<12$
* R ~ 7500
* Velocity precision everwhere better than 2 km/s
* Errors in *T*eff, log *g* and *Fe/H* depend on mag.


RAVEing mad...
Science

RAVEing mad...



Typical RAVE data frames zoomed at left to show high-velocity stars.

RAVEing mad...

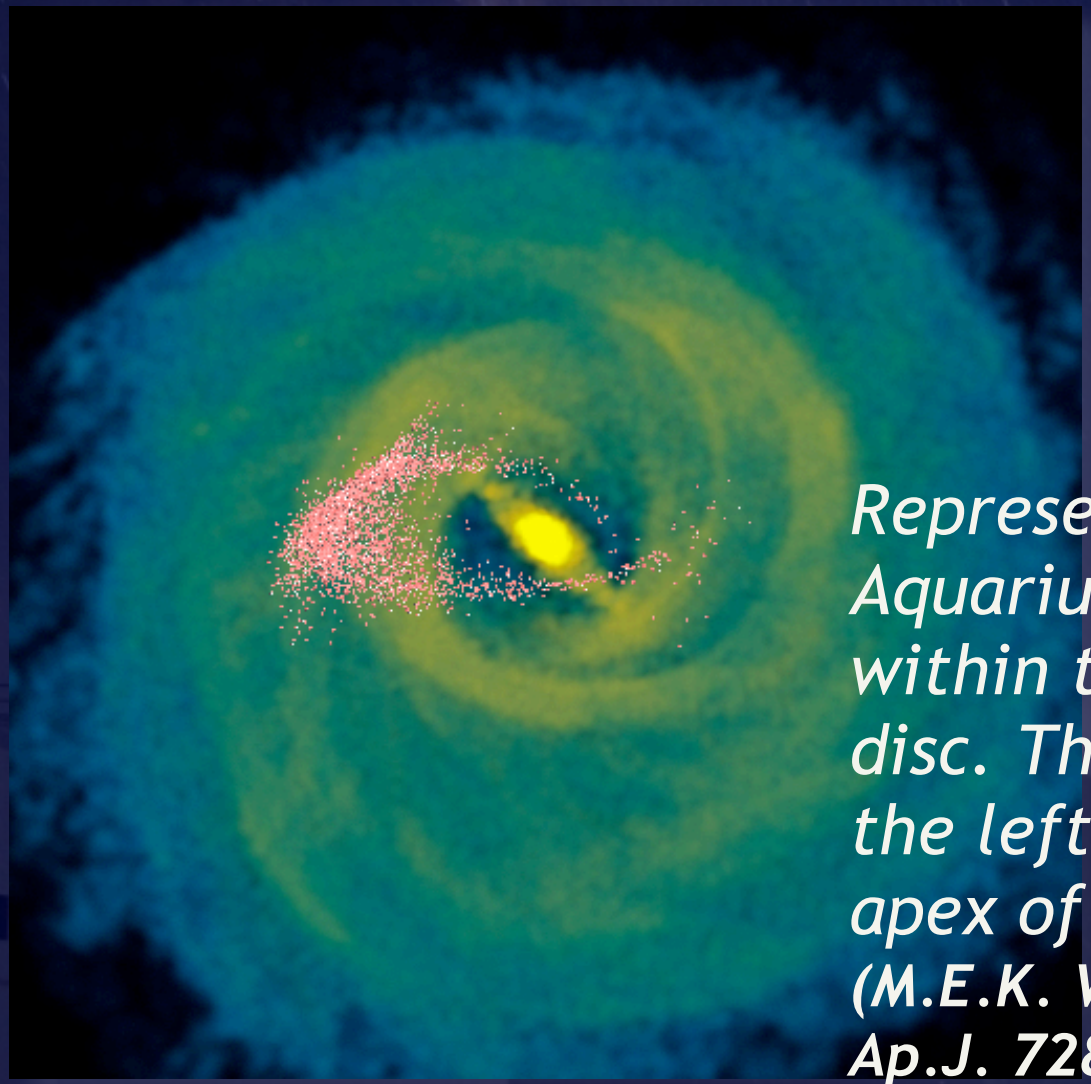
~25 science papers in the last five years.

In past year, 12 refereed papers, 3 PhD theses accepted.

Wide range of galactic topics:

- High-velocity stars
- Stellar distance determinations
- Thin and thick disc formation mechanisms
- Metal-poor stars
- Eccentricity distribution in thick disc stars
- New stellar streams

RAVEing mad...



Representation of the Aquarius Stream within the galactic disc. The Sun is on the left, close to the apex of the stream ***(M.E.K. Williams, et al., Ap.J. 728, 102, 2011.)***

RAVE spectrum..?

$A *vs.* €

$A *vs.* £

$A *vs.* $US

$A *vs.* ¥


But unusual things happen in Australia...
UN144N

GALAH: Galactic Archaeology with HERMES

Feeding the Giants

Ischia, 30 August 2011

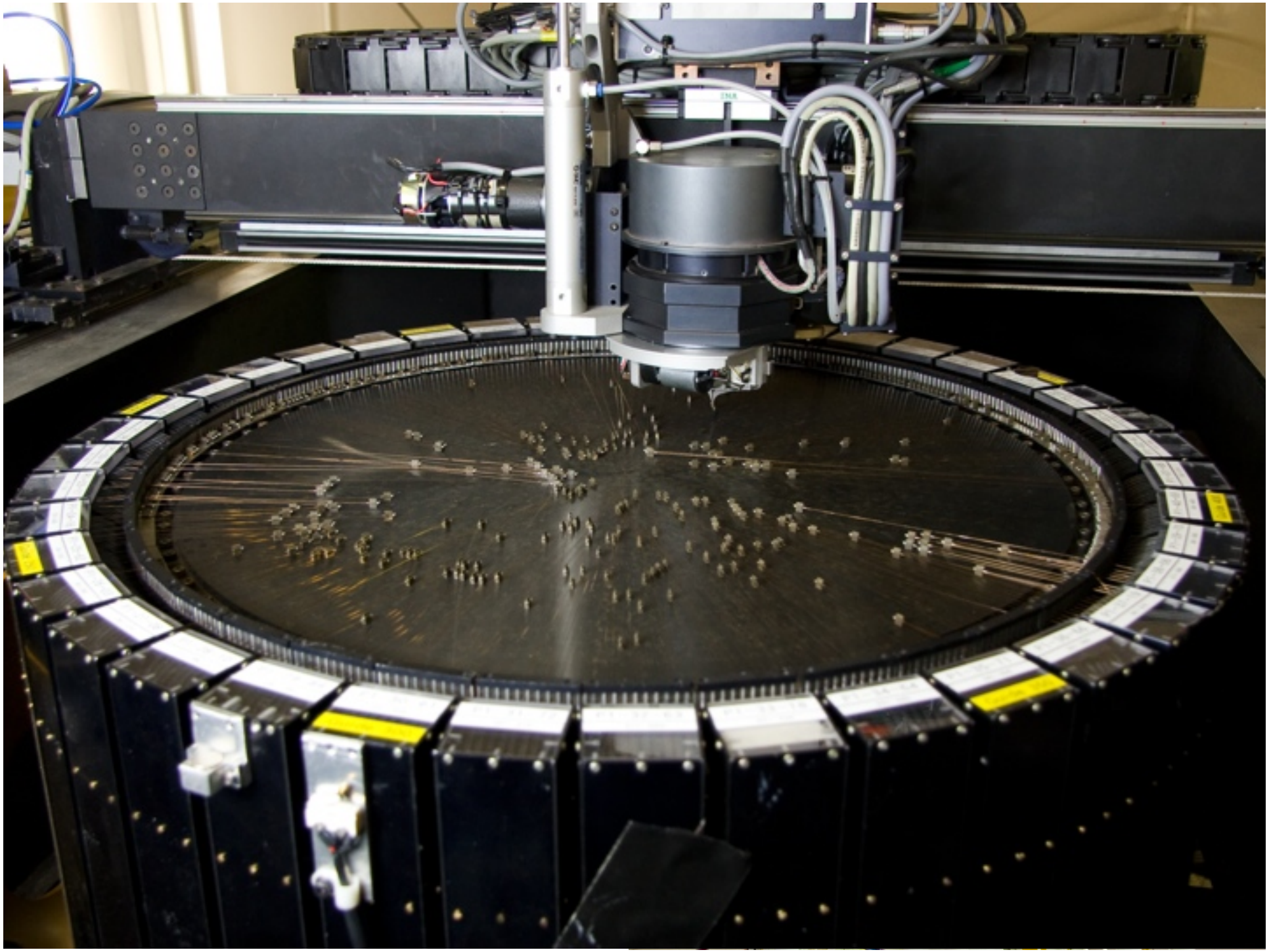
Fred Watson and the GALAH Collaboration

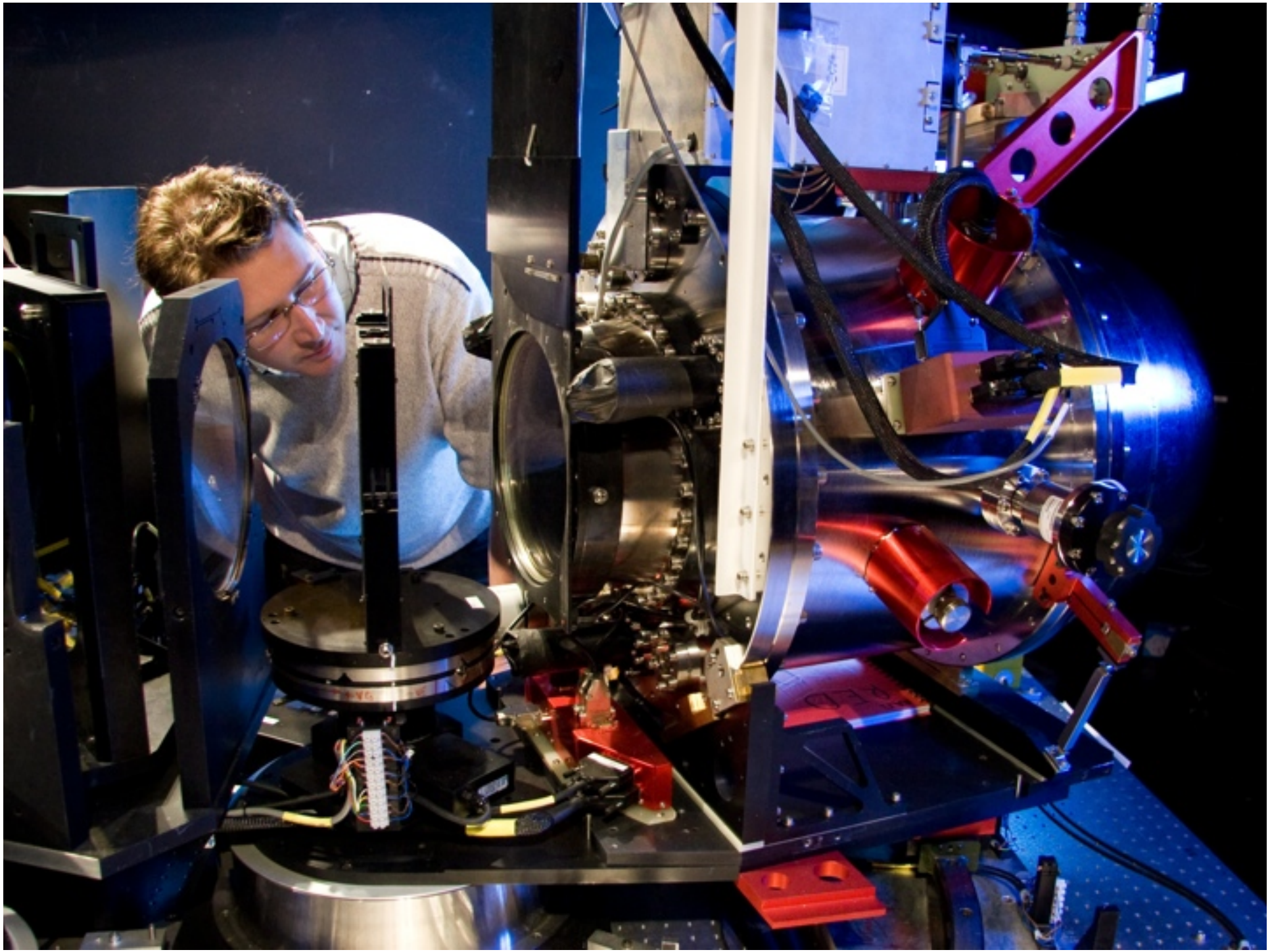
GALAH Collaboration:

Ken Freeman (ANU) (Co-PI), Joss Bland-Hawthorn (U.Syd) (Co-PI), Gayandhi De Silva (AAO) (Co-PI)

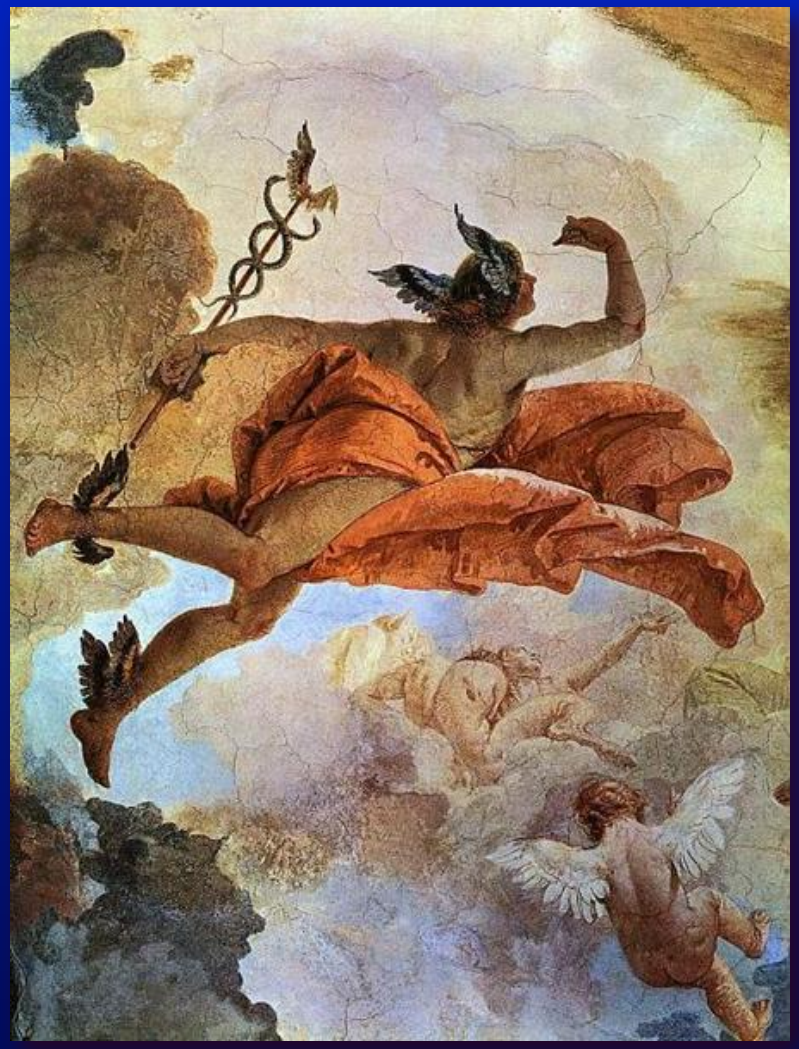
Asplund (MPA) (plus Lind, Bergemann), Bessell (ANU), Cannon (AAO), Cole (UTas), Cottrell (Christchurch) (plus Simpson), Da Costa (ANU), Dobbie (AAO), Ellis (USyd), Flynn (USyd), Karakas (ANU), Karlsson (USyd), Keller (ANU), Kobayashi (ANU), Lattanzio (Monash), Lewis (USyd), Lugaro (Monash), Monnet (AAO), Munari (Asiago), Murphy (ANU), Norris (ANU), O'Toole (AAO), Parker (AAO,Macq), Sharma (USyd), Sharp (ANU), Sneden (UTex), Watson (AAO), Wylie de Boer (ANU), Yong (ANU), Zucker (AAO/Macquarie), Zwitter (Ljubljana)


GALAH...
HERMES

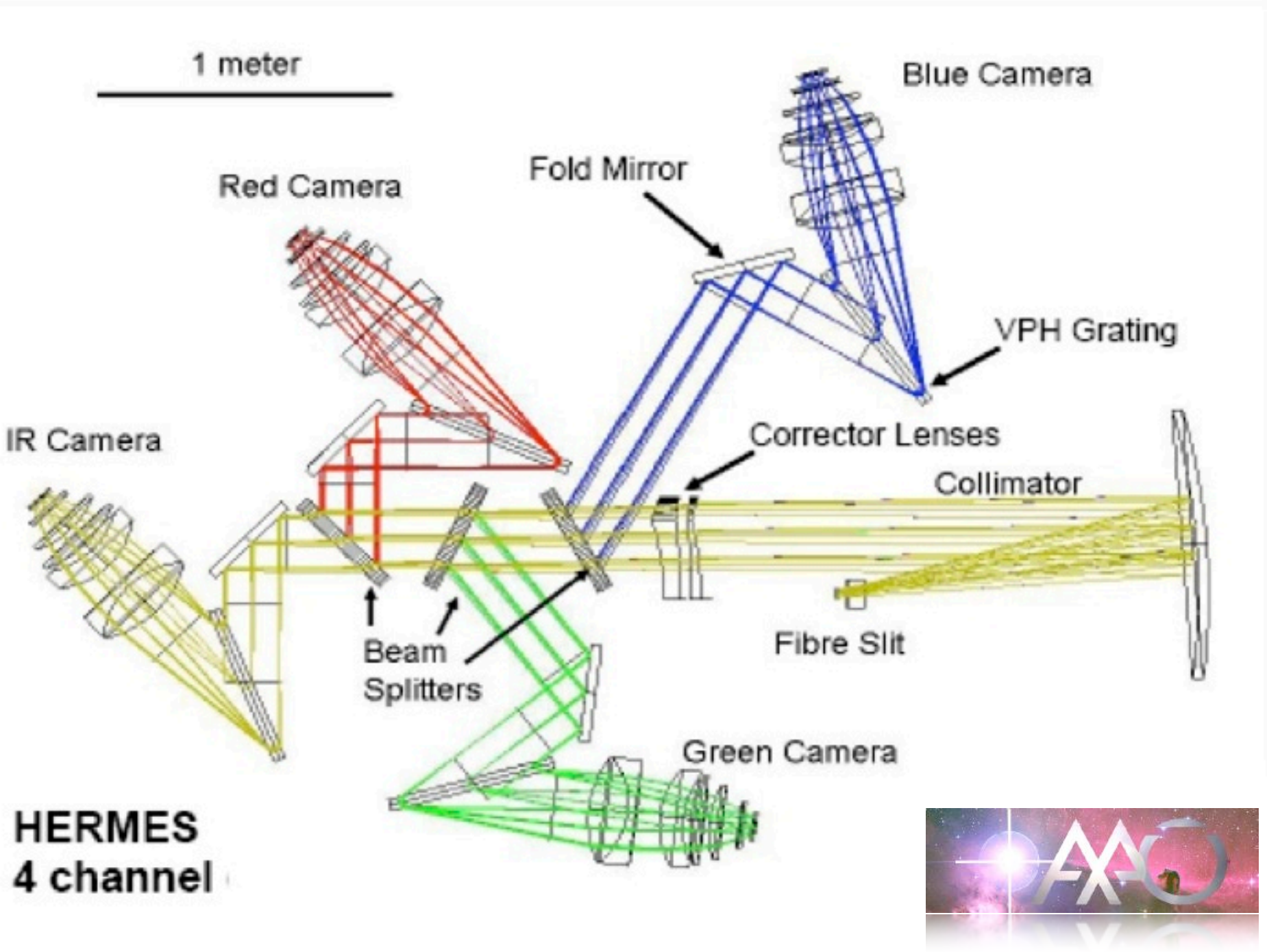




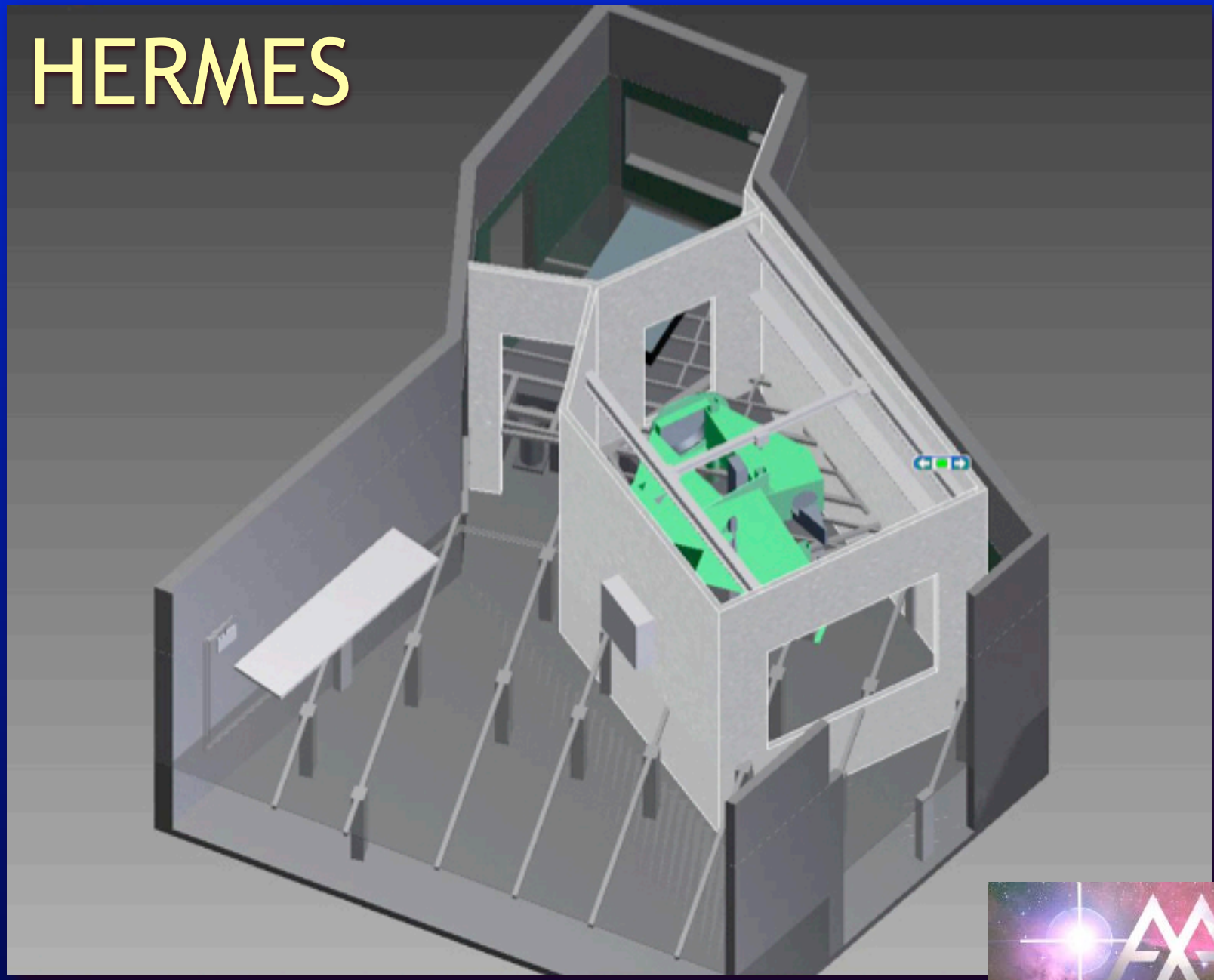
HERMES



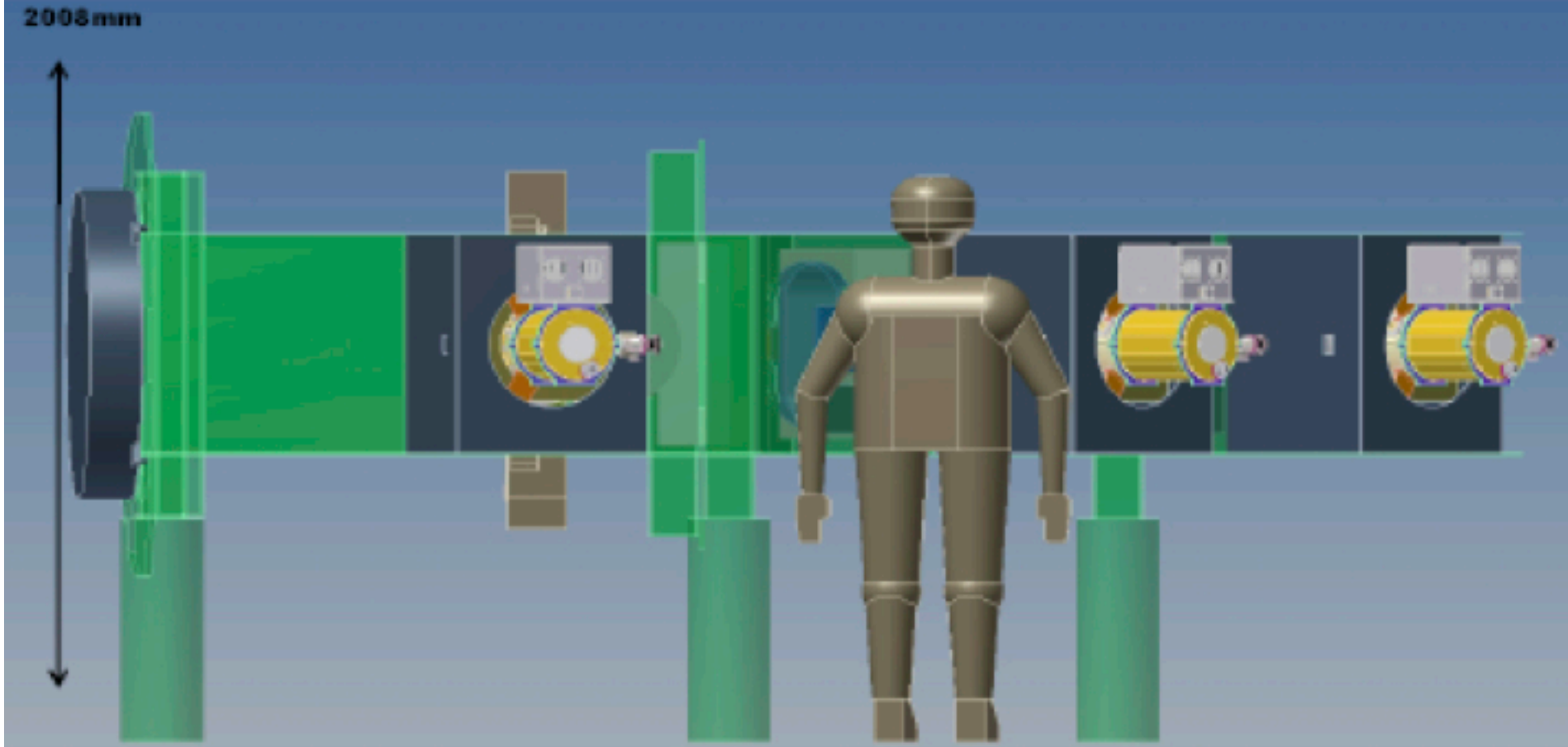
- 400-fibre spectrograph
- Minimum end-to-end efficiency 10%
- R~28,000 (up to 50,000 with slitlets)
- Four channels ~ λ/25 wide for GA
- Centred on 478nm, 577nm, 661nm, 774nm
- Th-Xe arc calibration
- Thermal control to 0.5C
- First light late 2012


1 meter
Blue Camera
Fold Mirror
Red Camera
VPH Grating
IR Camera
Corrector Lenses
Collimator
Fibre Slit
Beam
Splitters
Green Camera
HERMES
4 channel

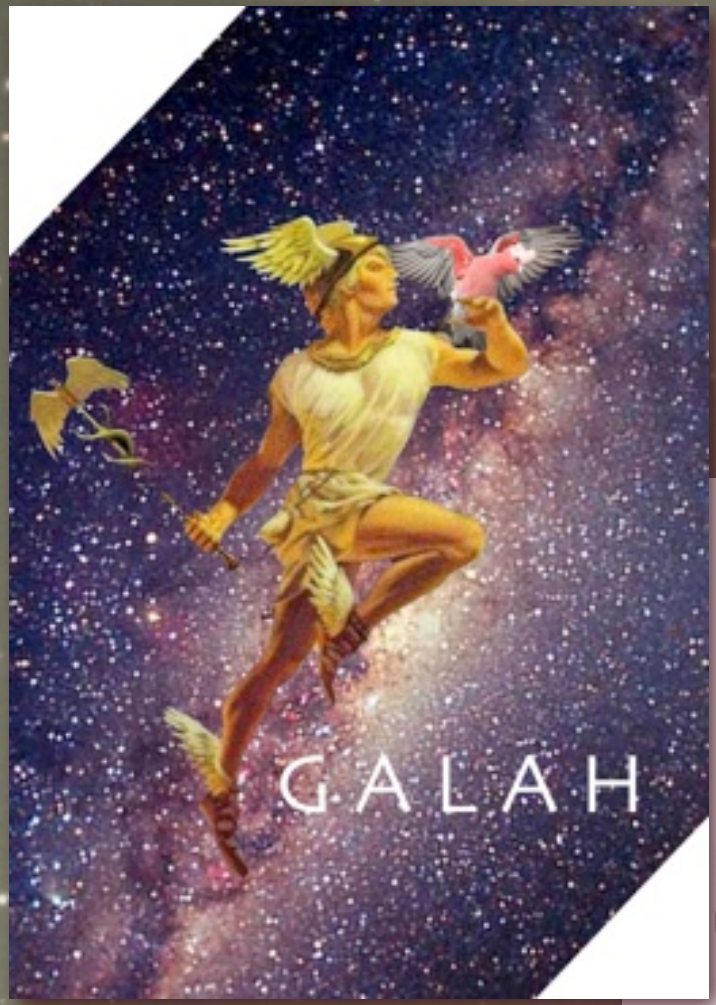
HERMES



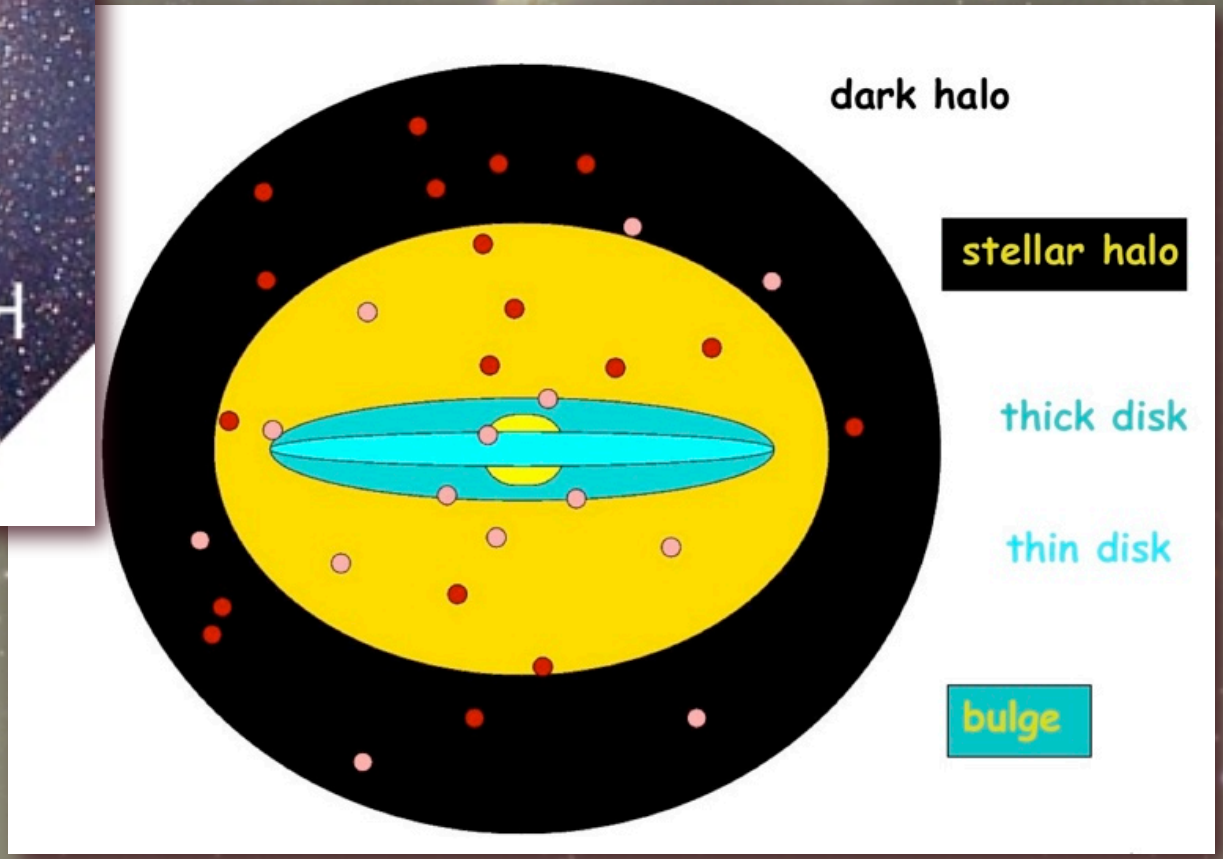
HERMES

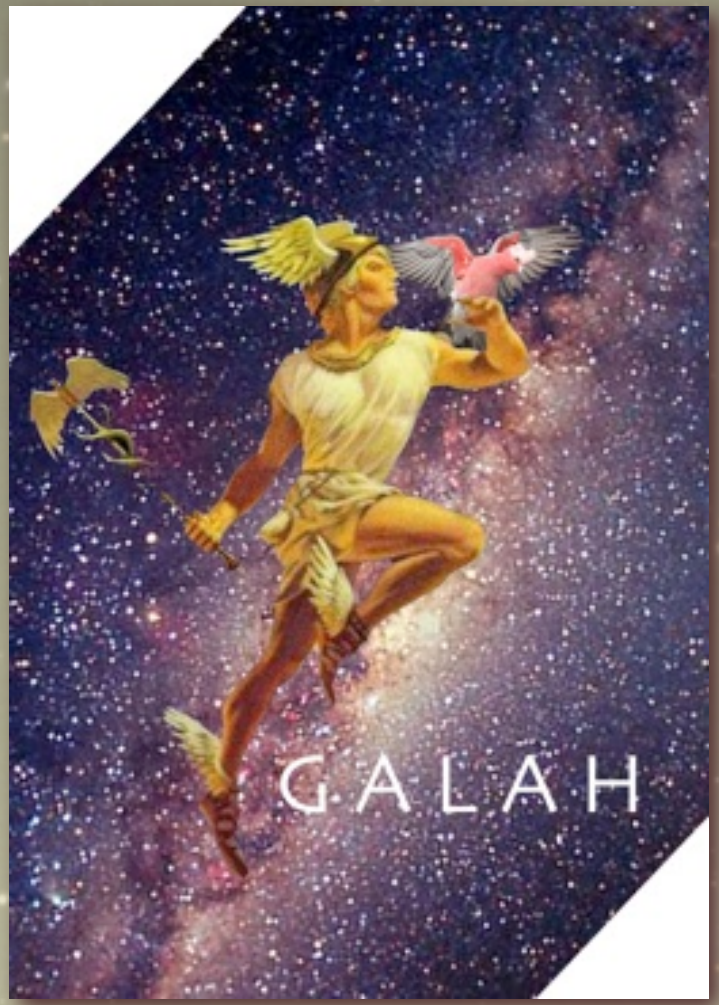



GALAH
R. Jay GaBany, Blackbird Observatory



- RV better than 20 m/s
- Huge synergy with GAIA





- Identify stellar accretion events, particularly the earliest ones representing the founding blocks of the galactic disc
- Measure accurate chemical abundances of elements involved in the main nucleo-genesis processes - *'chemical tagging'* (accuracy ~0.5%)
- 1 million stars to V=14
- ~1,000 AAT observing nights

- Includes light (Li), odd-z (Na, Al), alpha (O, Mg, Si, Ca, Ti), Fe-peak (Cr, Mn, Fe, Co, Ni, Zn), light s-process (Y, Zr), heavy s-process (Ba, La) and r-process (Eu) elements... ***Perfect diet for Giants***


Finally, news from a different giant...

RAVE and GALAH

Thanks, everyone

RAVE and GALAH

Thanks, everyone