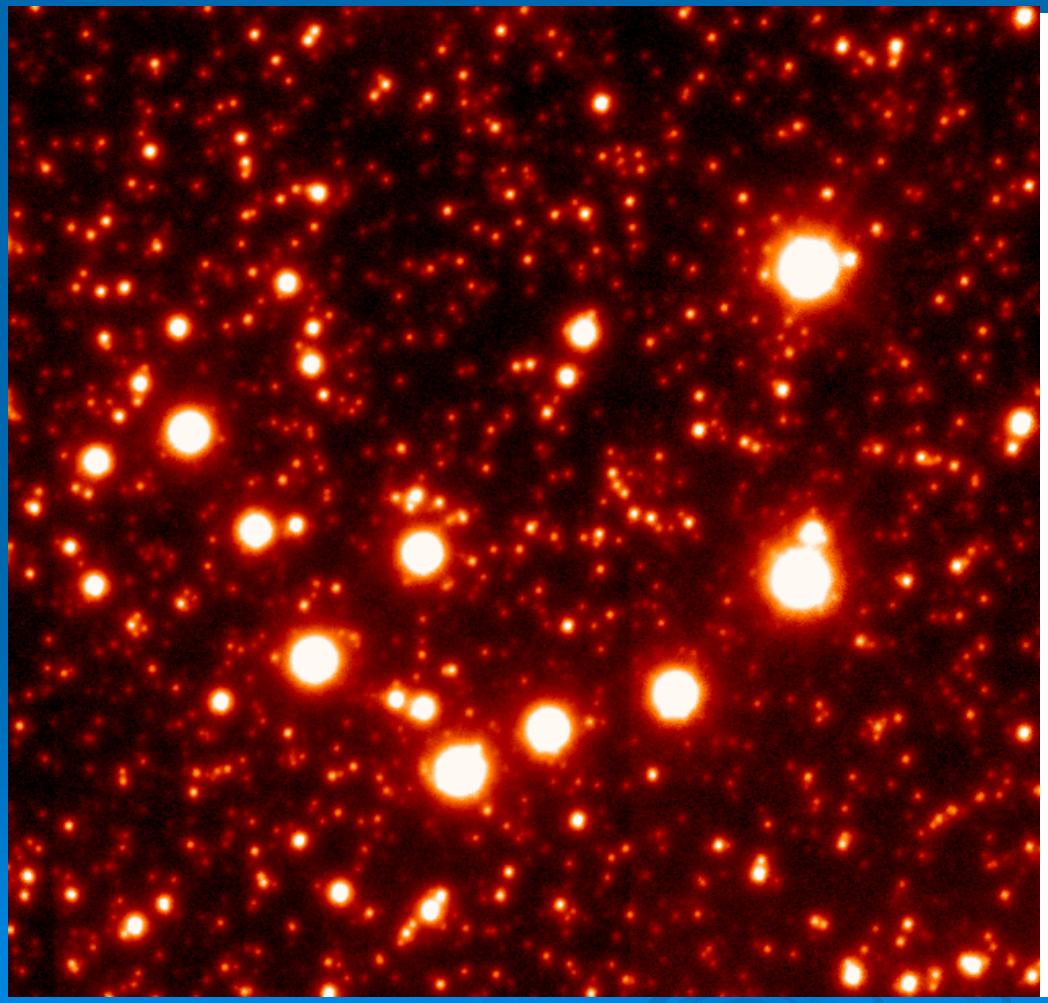
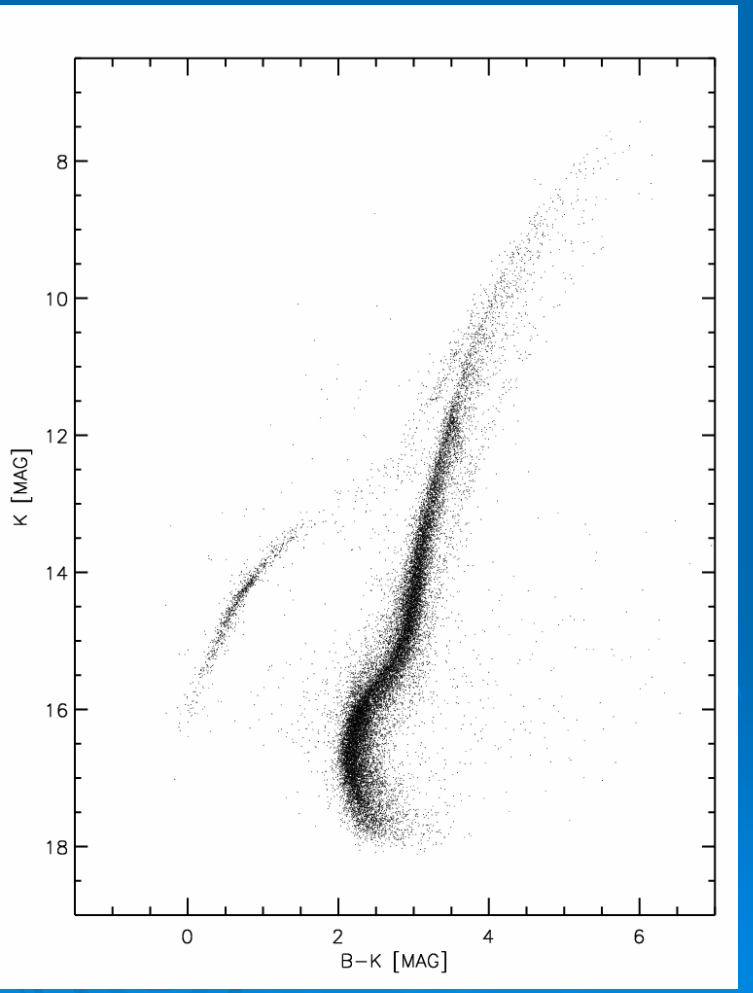
Crowded Stellar Images Photometry

I- The problem





Crowded Stellar Images Photometry
I- The problem

- Select/develop a “good” algorithm for accurate colour (1%?) photometry of dense stellar fields
- minimum coverage Ks & I (shorter λ even better)
- Image stacks (10ths) to improve depth
- each with different, poorly known PSF
- very large PSF differences between Ks & I
- significant PSF variations inside 15-30” field
- plus PSF dependence on star colour!

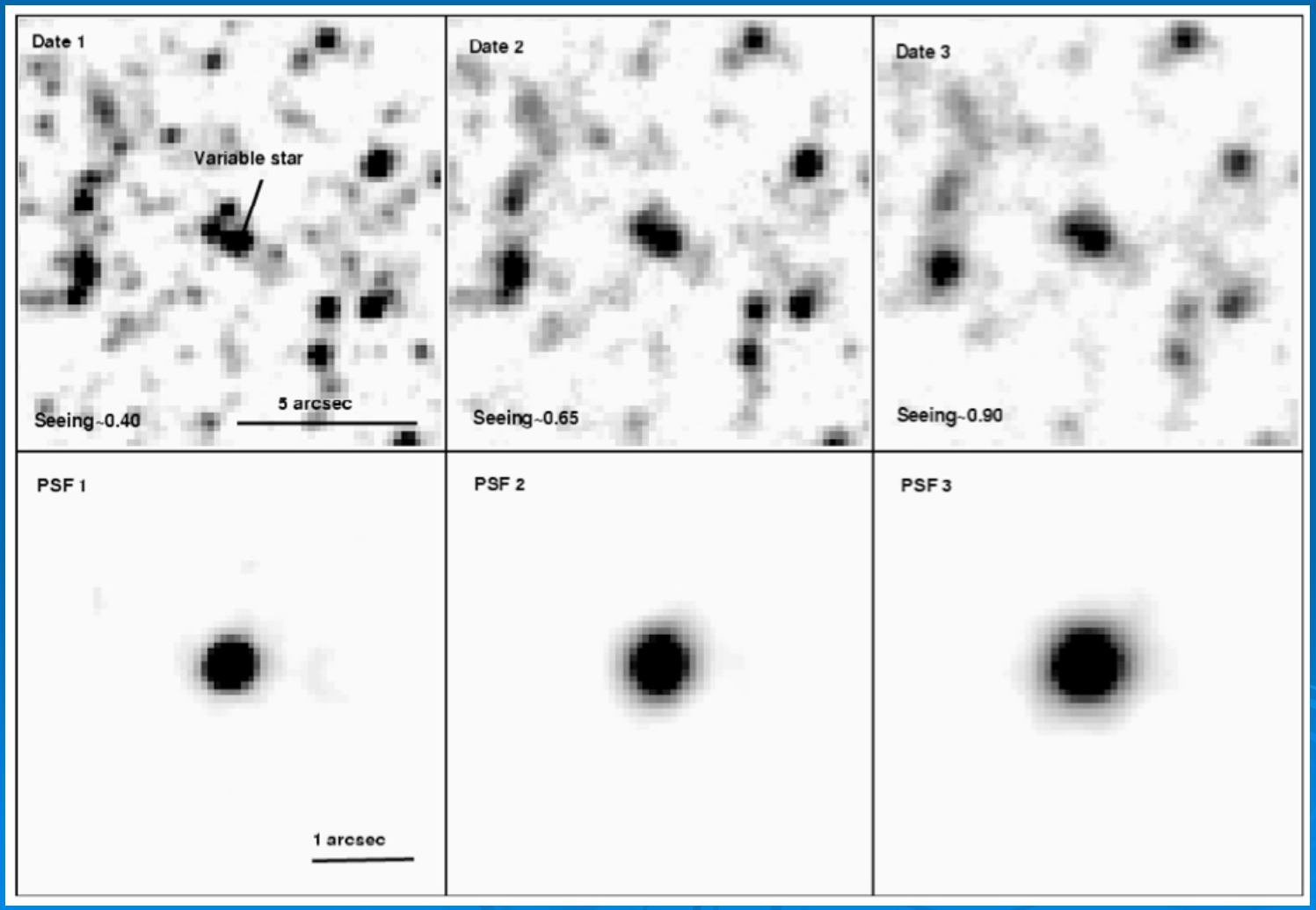
Crowded Stellar Images Photometry
II- Impact on NIRI

- D-L mode with minimum 3x3 pixel sampling
- minimum coverage Ks-I (R?)
- A 1st step PSF estimator would be very useful (from C_n^2 profile, AO ancillary data, OPD model)
- need for both LTAO & MCAO modes
- need for photometric calibration faint fields (VLT?)
- need for absolute astrometry ~ ± 100 mas
- need for D-L IFU Spectroscopy @ 0.85 μm

Transmitted to Instrument Teams

Crowded Stellar Images Photometry

III- The possibilities



Crowded Stellar Images Photometry
III- The possibilities

- Use/adapt public package: StarFinder; DaoPhot; RomaPhot; SExtractor
- G. Rousset/T. Fusco myopic deconvolution
- P. Magain/F. Courbin MCS deconvolution
- E. Thiébaut iterative fitting algorithm
- N. Devaney Hotelling Observer

Any one sizable effort = 1 FTE x 3-year

Crowded Stellar Images Photometry
IV- Next steps

- Transmit analysis to SWG (→ DRM)
- Converge on one approach with the selected Diffraction-Limited Imager Instrument Team