

Starspots & Magnetism

Testing the
activity paradigm
in the *Pleiades* &
Messier 67
star clusters

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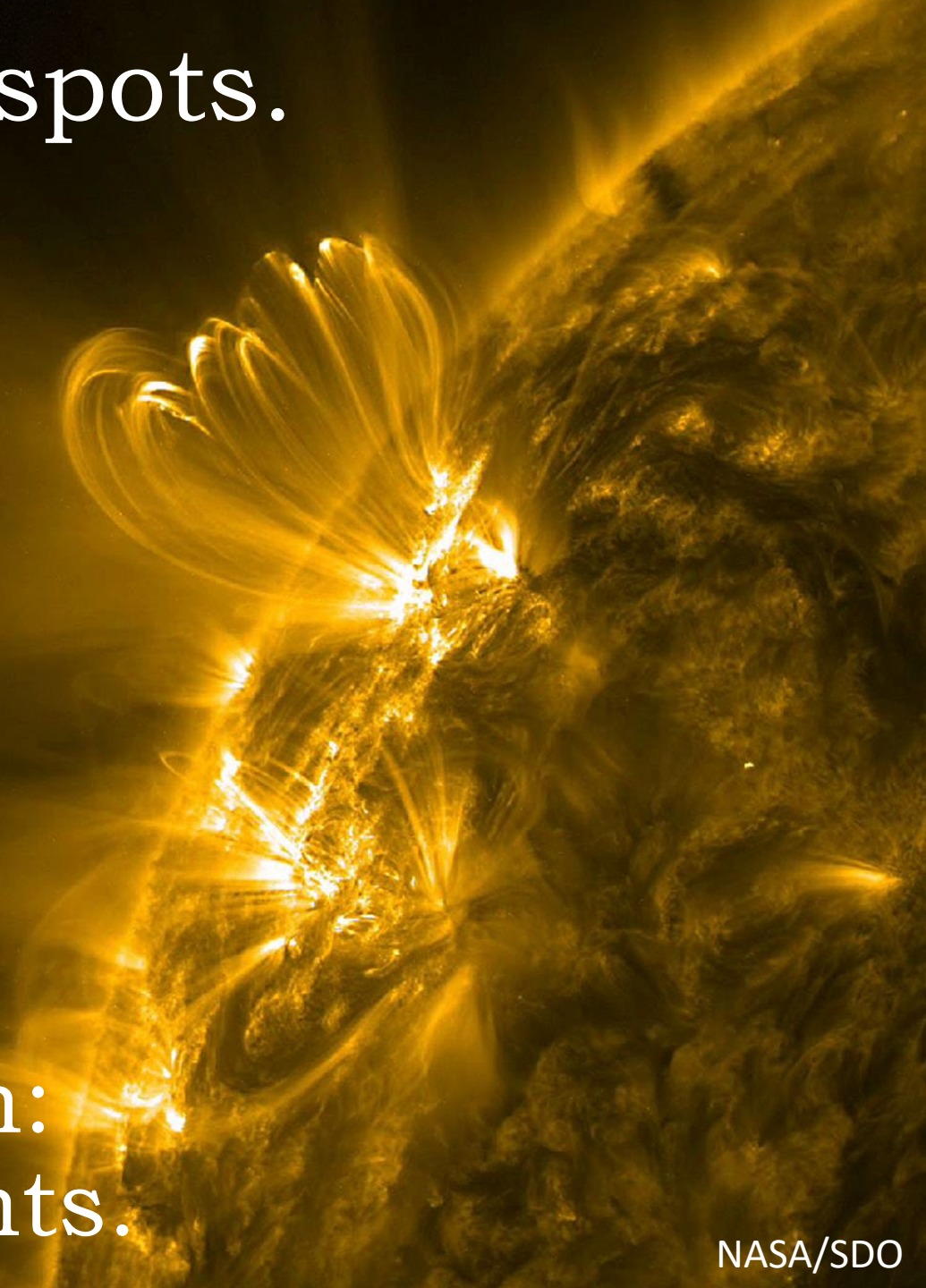
Talk: Thursday AM, Session 429

Real stars have magnetic spots.

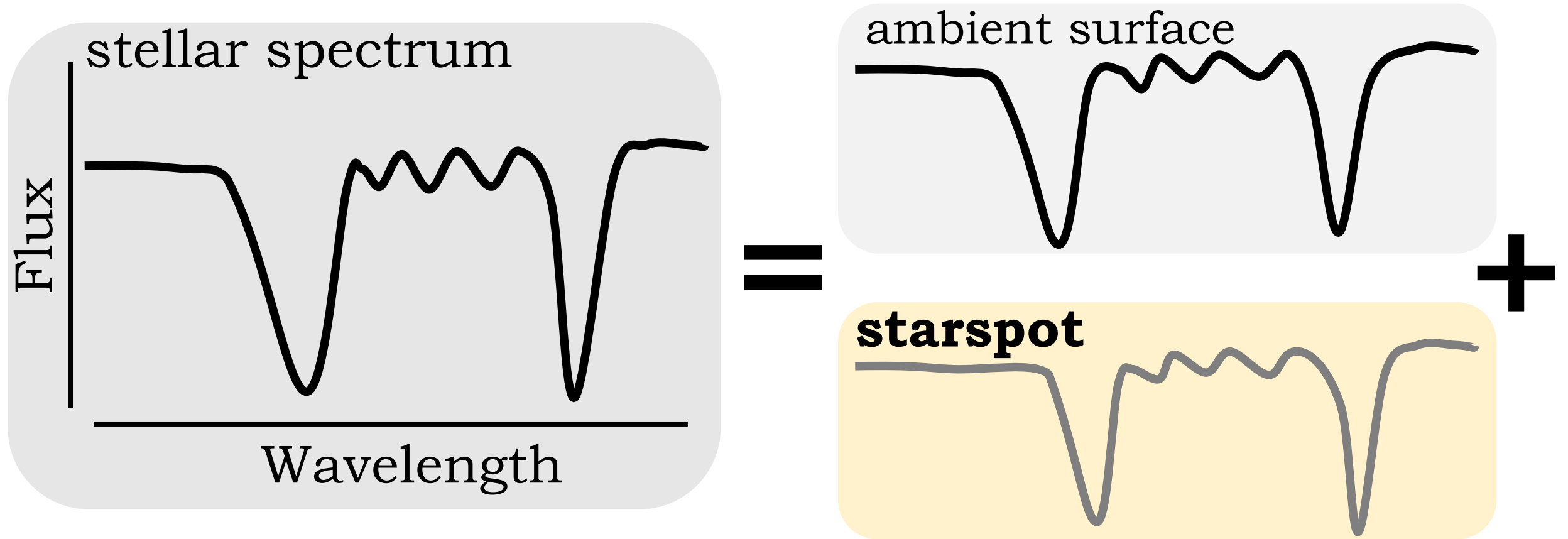
Starspots force flux redistribution and *change* stellar structure.

Standard stellar models are nonmagnetic.

Linking theory & observation:
direct magnetic measurements.



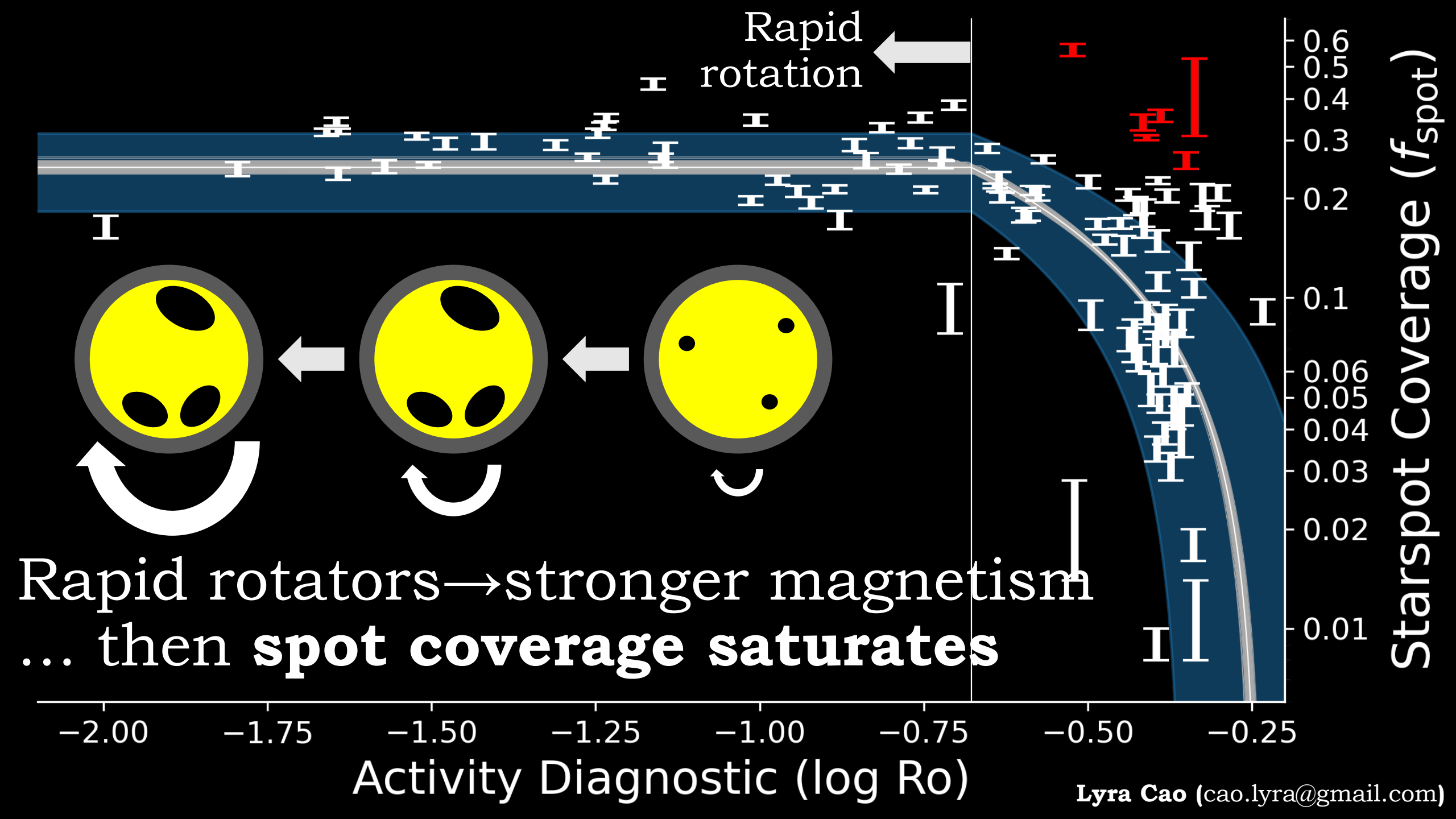
Our approach: automated **two-temperature** fits on SDSS APOGEE **infrared** spectra

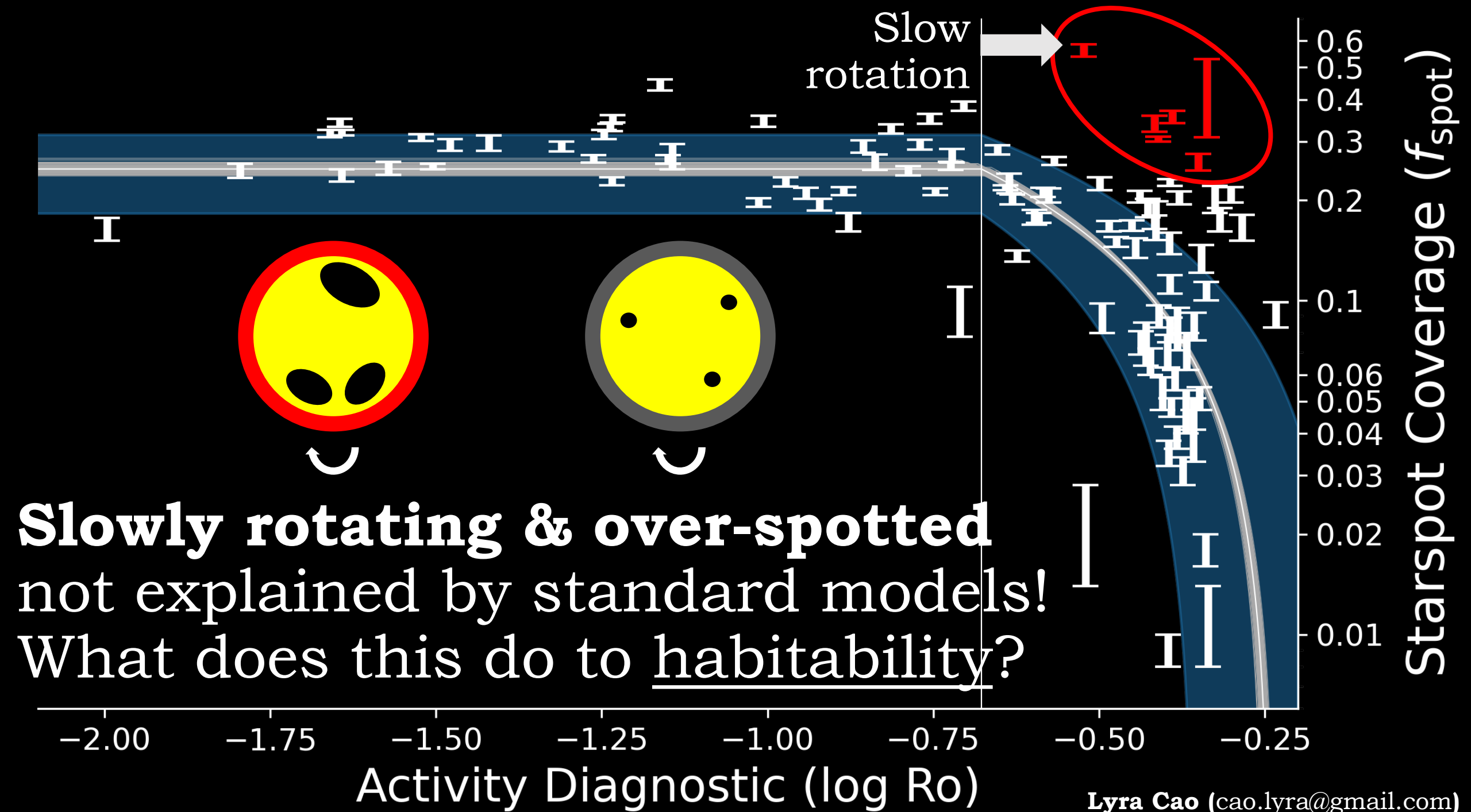


Direct, precise magnetic measurements

From $\sim 10^3$ measurements to $\sim 700,000+$

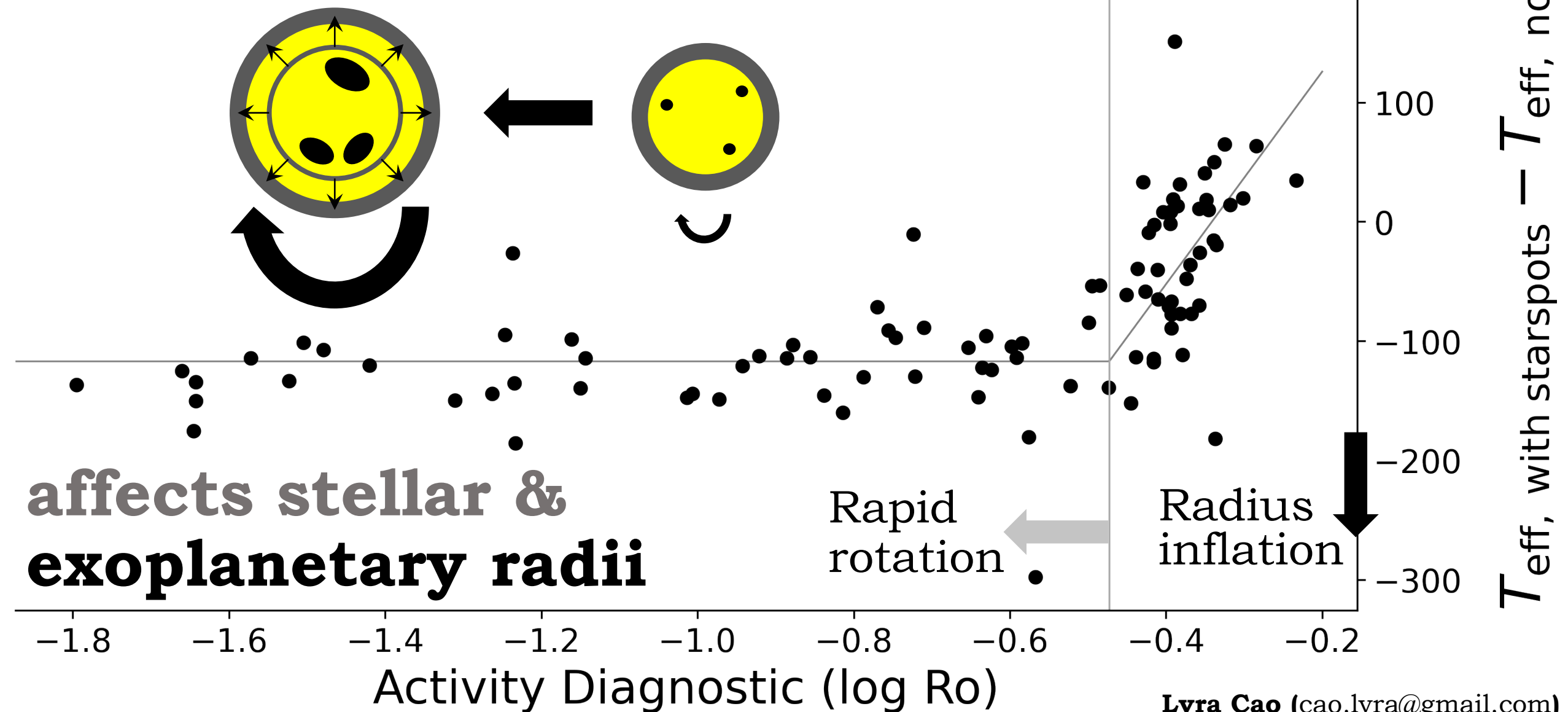
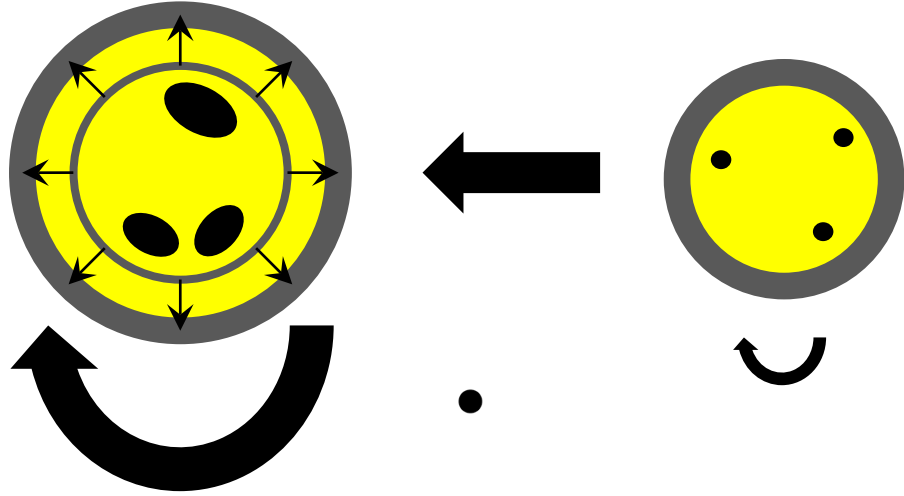
Allows open cluster samples for the first time.

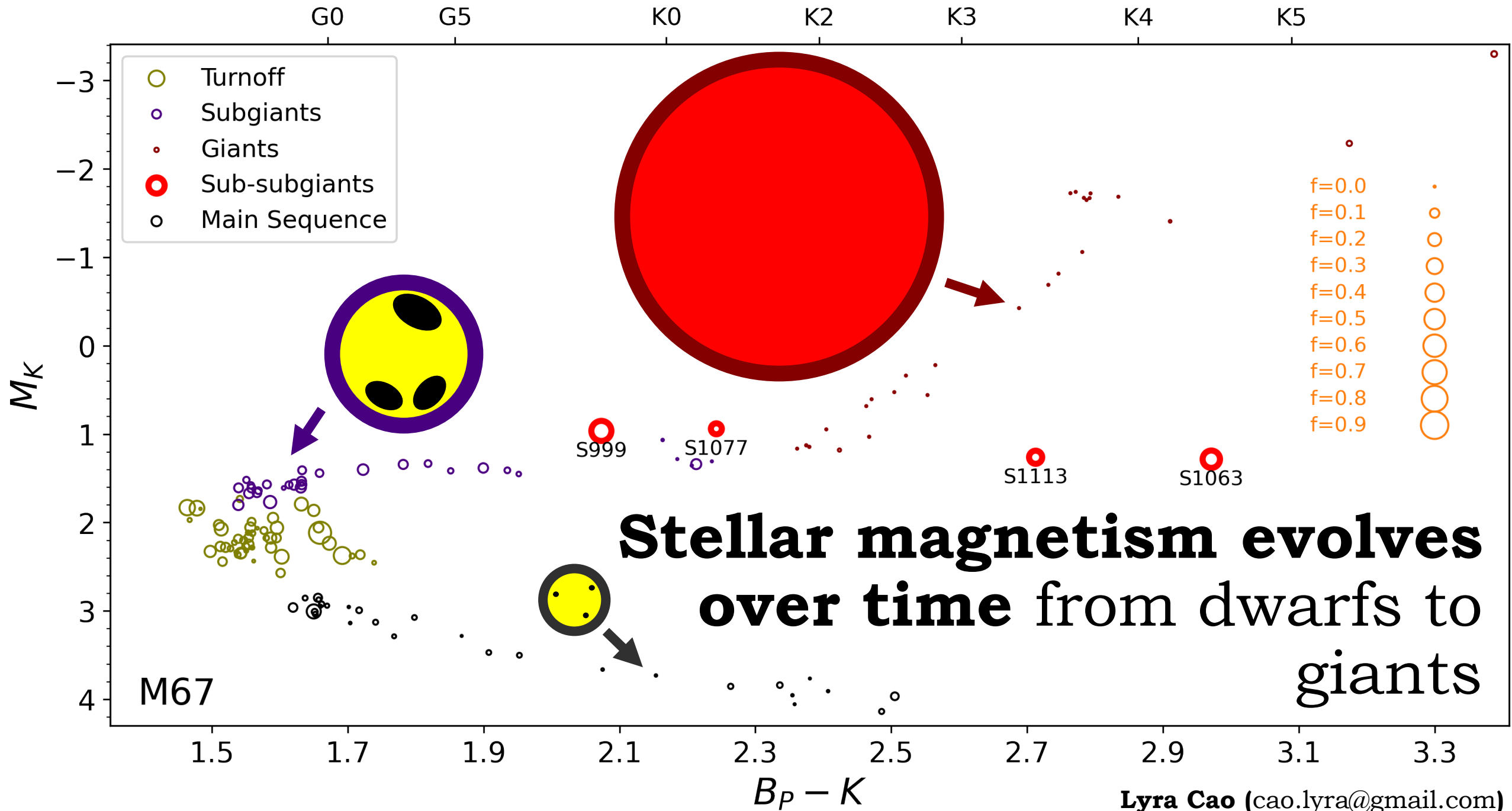




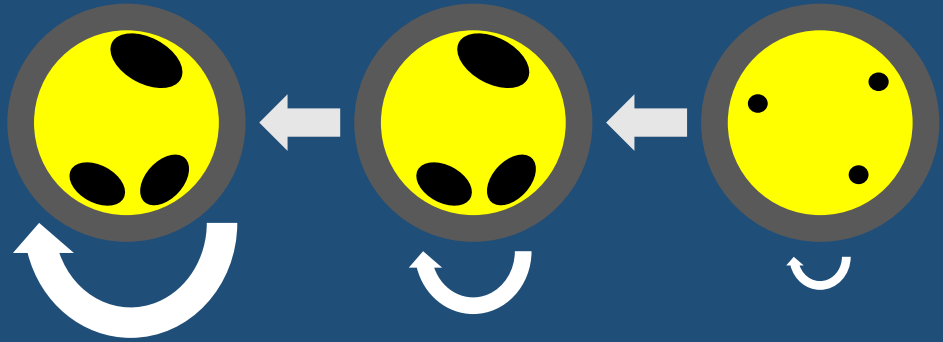
Radius inflation (as seen in EB's)

a feature of starspot fits!



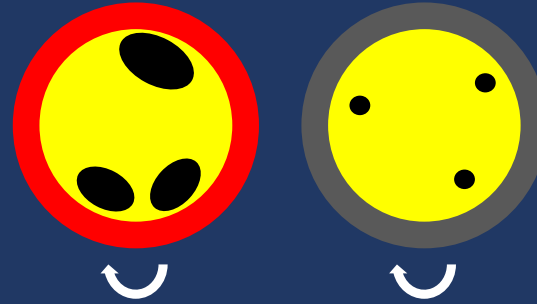


Magnetism in star clusters: a new paradigm

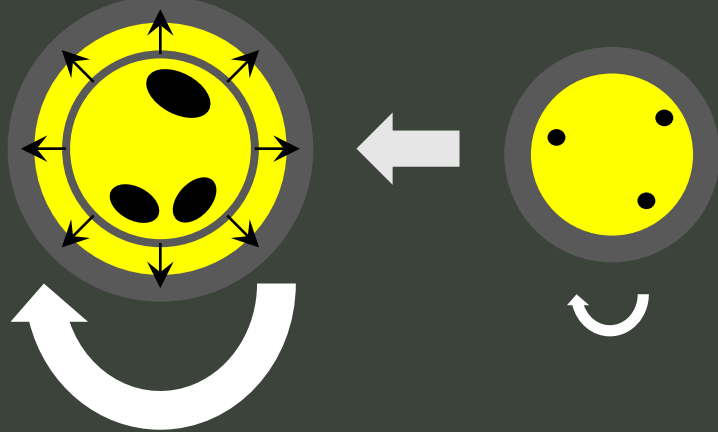


1. Saturation in surface spots & magnetic fields

2. Overactive stars irradiating planets?

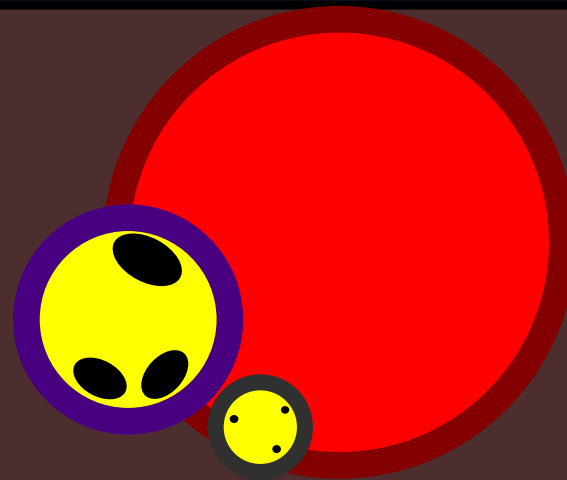


100-1000x more spots than before, using SDSS / APOGEE spectra (Cao, *in prep*).



3. Starspot fits improve stellar & planetary radii

4. Stellar evolution changes activity



Starspots: essential for accurate stellar & exoplanetary astronomy!