Mode Physics

Appourchaux, Baudin, Boumier,
Dupret, Gough, Houdek

Modes for Physics

Appourchaux, Baudin, Boumier,
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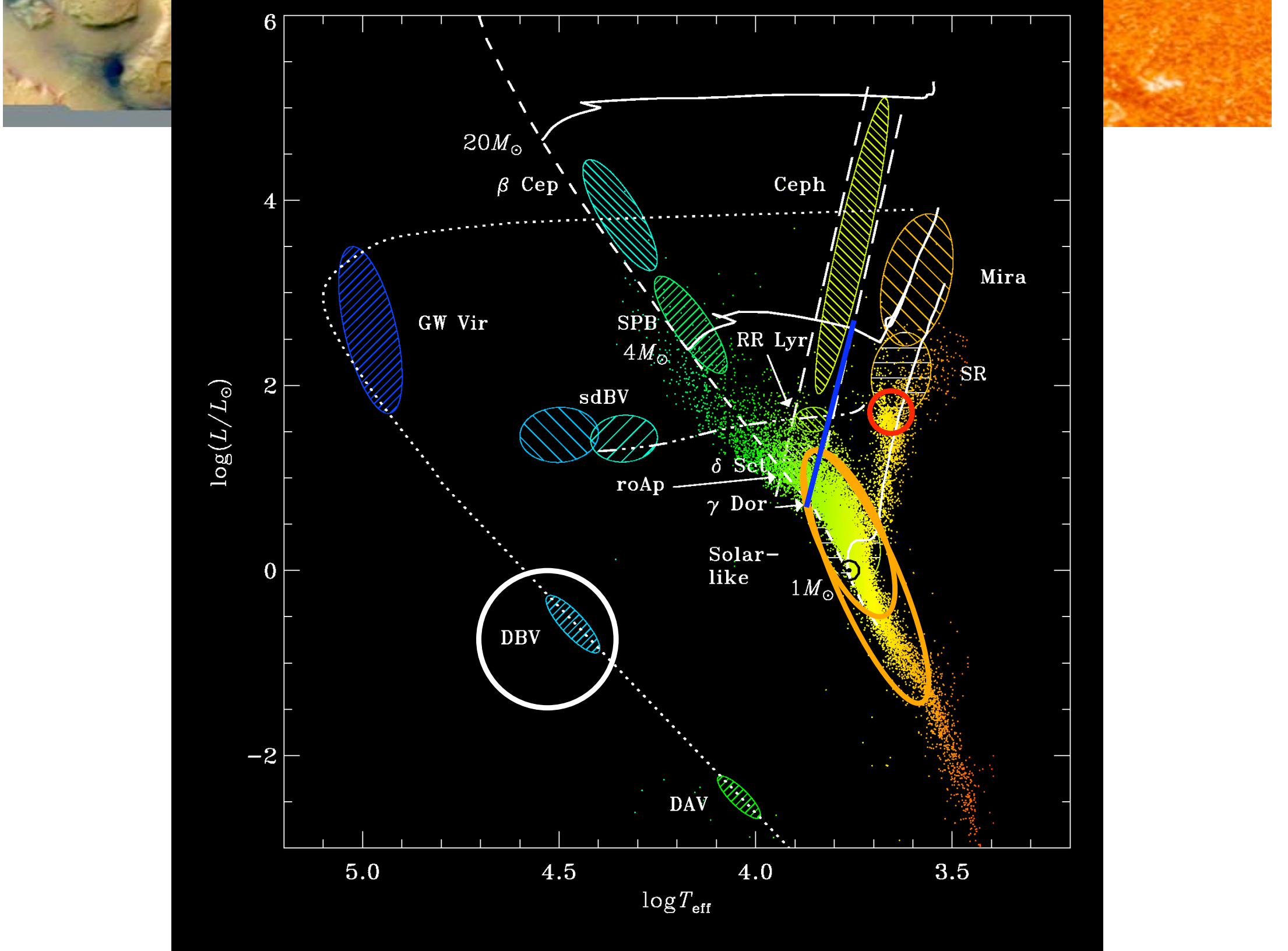
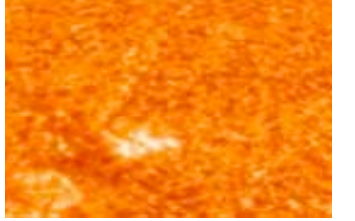
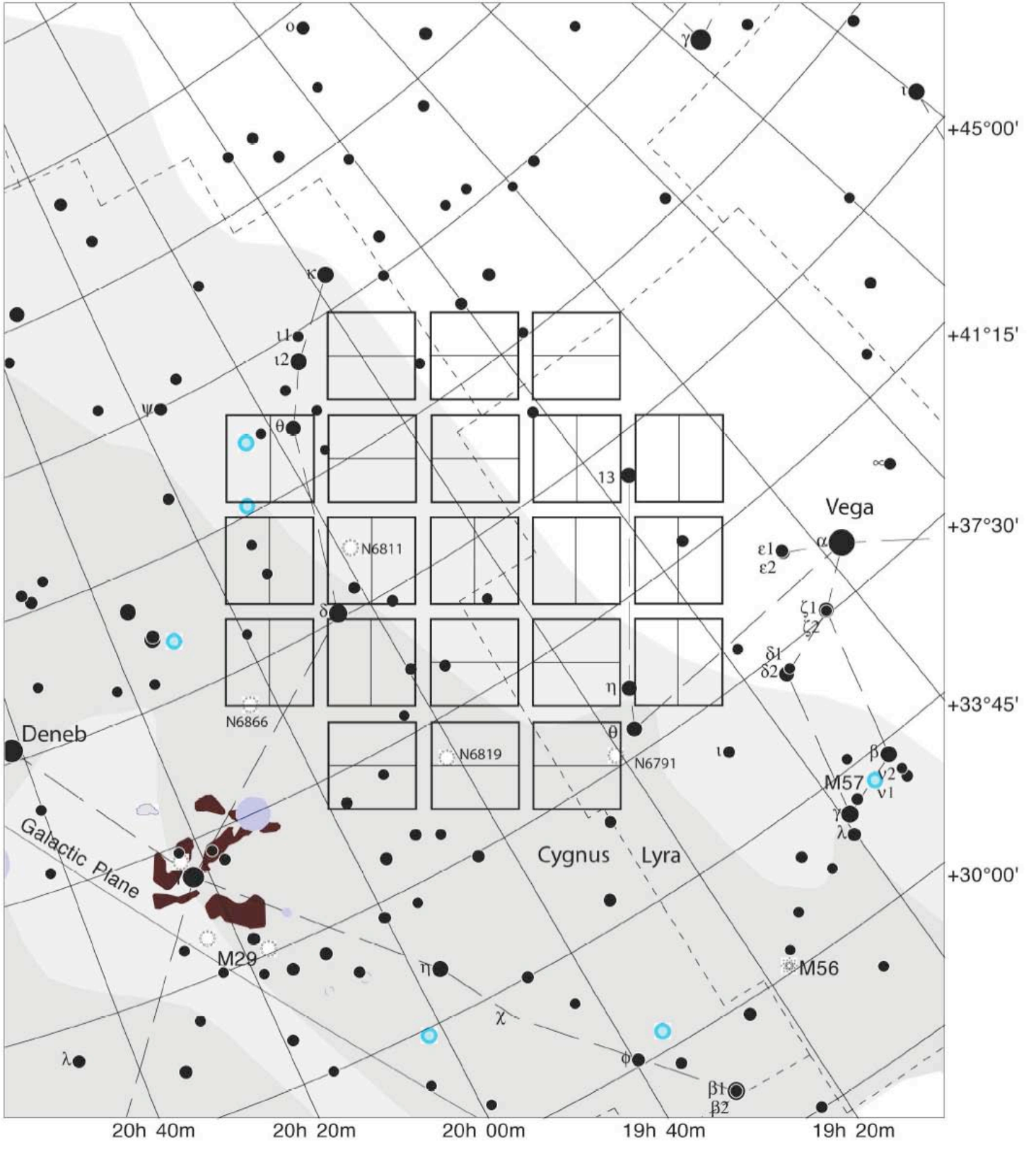

6
4
2
0
−2
log(L/L⊙)
5.0
4.5
4.0
3.5
log T_eff
20M⊙
β Cep
Ceph
Mira
GW Vir
SPB
4M⊙
RR Lyr
SR
sdBV
δ Sct
roAp
γ Dor
Solar-
like
1M⊙
DBV
DAV




+45°00'
+41°15'
+37°30'
+33°45'
+30°00'
20h 40m
20h 20m
20h 00m
19h 40m
19h 20m
Vega
Deneb
Galactic Plane
Cygnus
Lyra
M29
M56
M57
N6811
N6866
N6819
N6791
13

All pulsating stars are interesting

Not entomology, not even sismology but physics

Physics

- Solar-like stars: excitation and damping mechanisms (convection, metallicity…),
- Red giant stars: mechanism?
- Classical pulsators: non-linear physics, saturation effects, mode coupling
- Classical pulsators: do they have stochastically excited modes? If yes why?
- White dwarves and others: g-mode damping mechanisms
- roAp stars: how are the modes aligned? (spots, rotation)
- All stars: check models predicting stable / non stable modes

Methodology

- Solar-like stars: linewidth, amplitude of the modes as a function of frequency (wary of activity)
- Open clusters: linewidth, amplitude of the modes as a function of frequency (same age, metallicity)
- Classical pulsators: get amplitude, detect solar-like p modes

Implementation

- Short cadence: solar-like stars (yes I'll take everything), white dwarves?, classical pulsators
- Long cadence: all other stars, how many?
- Output of MLE fitting and sine wave fitting WPs
- WP: Mode for Physics
- Linked to WP: Stellar noise characterisation