

# Binary fraction of magnetic chemically peculiar stars

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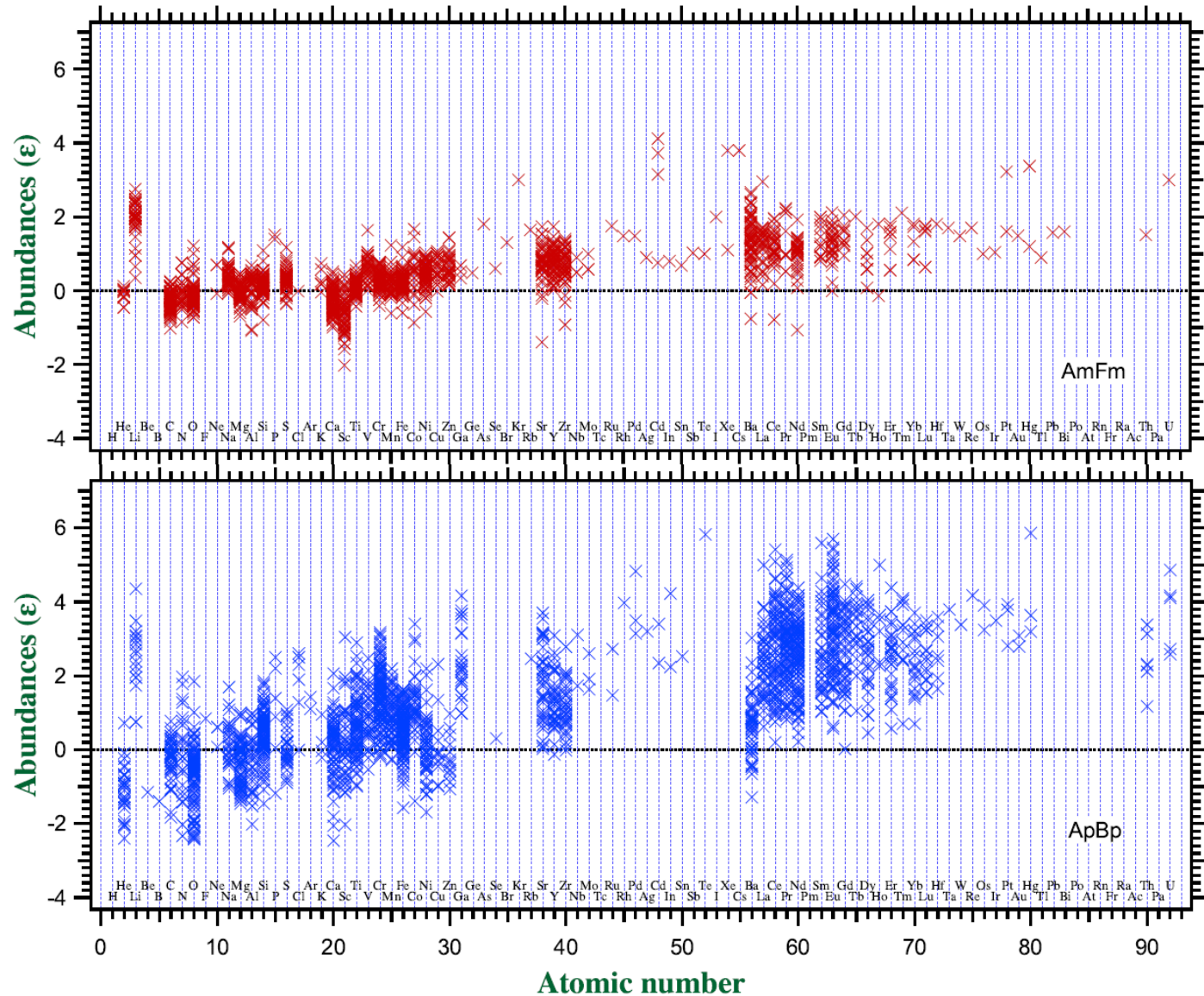
Brno

Česká republika



# What are chemically peculiar stars?

Ghazaryan et al., 2018, MNRAS, 480, 2953

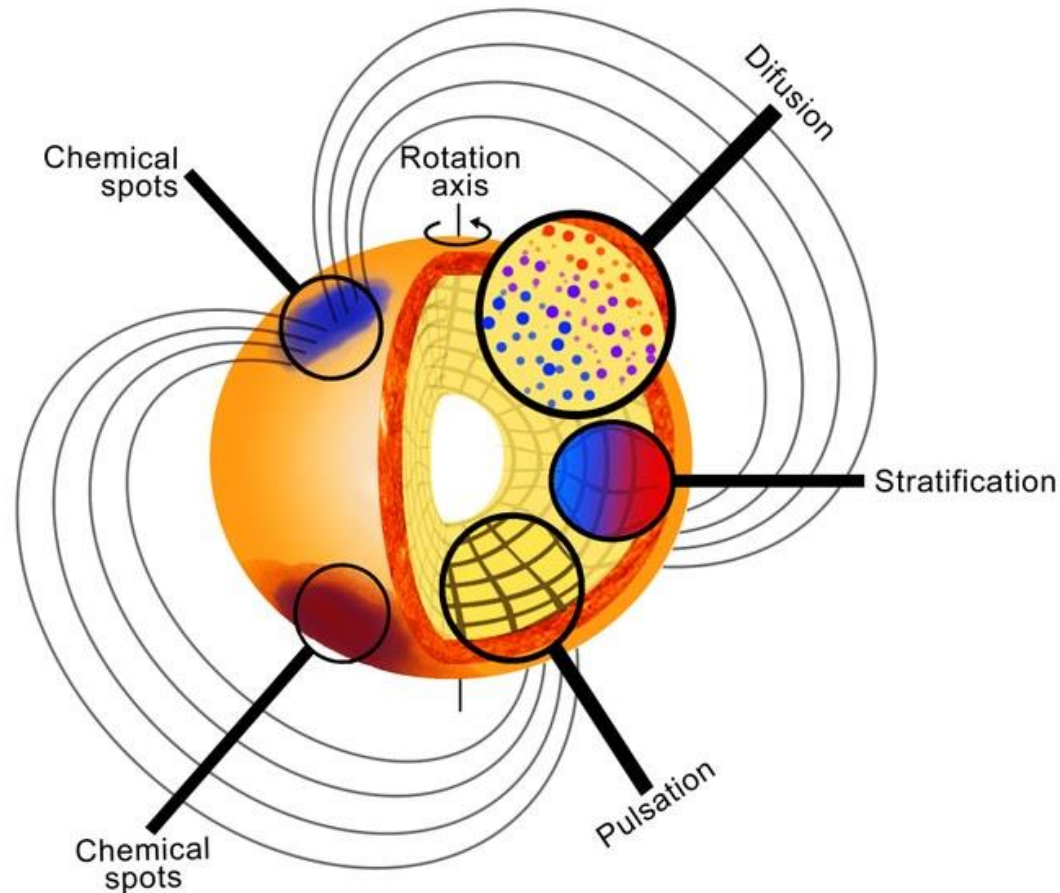


Non-magnetic

Magnetic

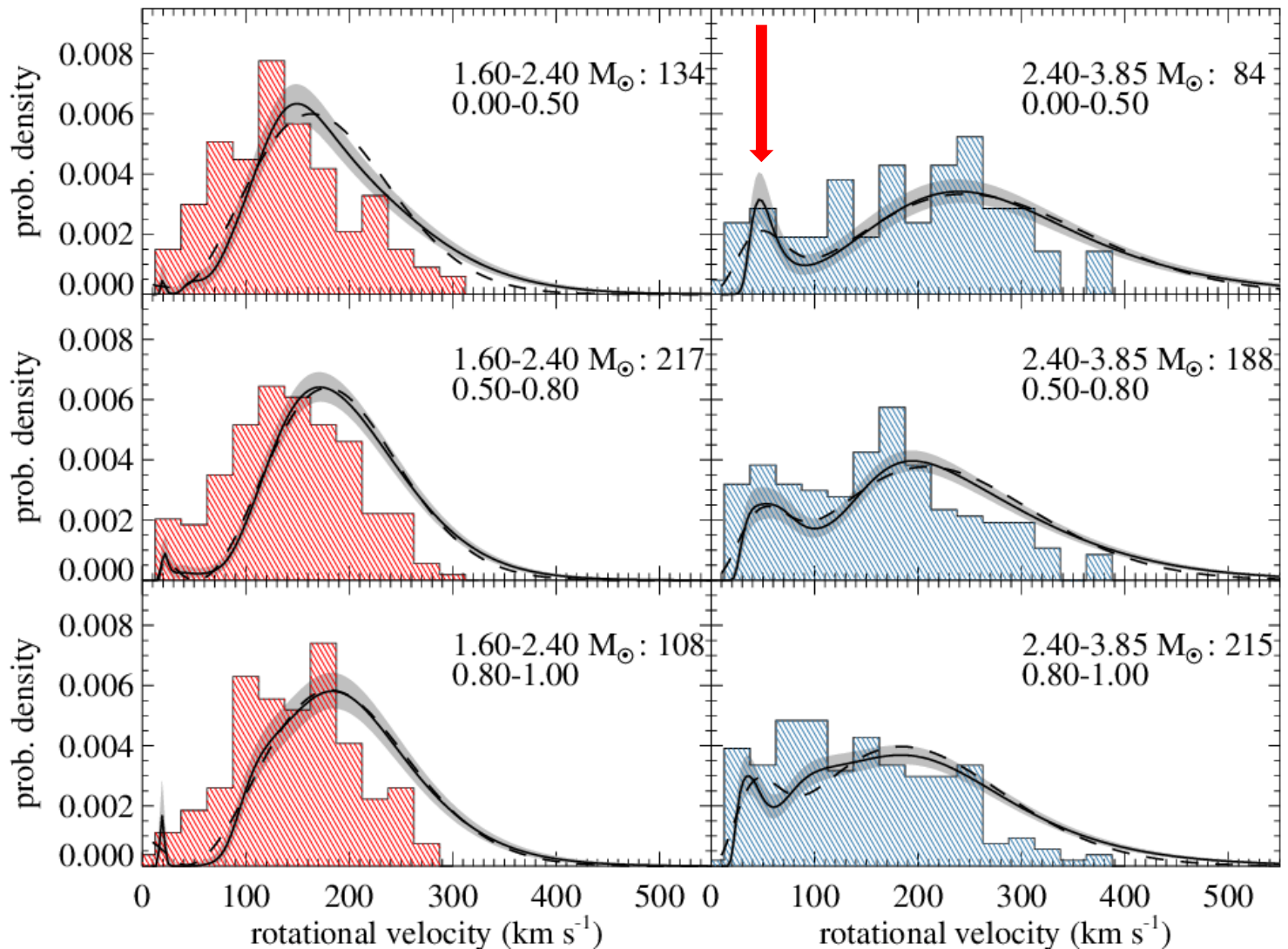
- Upper Main Sequence: B- to early F-type stars

# What are chemically peculiar stars?



- Works only with “low” rotational velocity

# Low rotational velocity



- Mixing wins over diffusion for  $v > 100 \text{ km/s}$

# CP stars in spectroscopic binary systems

- Non-magnetic subgroups
  1. CPI (Am/Fm) stars: **almost no single stars** known from a sample of 4300 objects
  2. CP3 (HgMn) stars: **at least 2/3** are in SB2 systems from a sample of about 170 objects
- Magnetic subgroup
  1. Abt & Snowden (1973, ApJS, 215, 137): **20%** (sample of 45 stars)
  2. Gerbaldi et al., (1985, A&A, 146, 341): **46%** (113)

# CP stars in spectroscopic binary systems

- Magnetic subgroup
  3. Carrier et al. (2002, A&A, 394, 151): **43%** (119)
  4. Rastegaev et al. (2014, Astrophysical Bulletin, 69, 296): **23%** (273)
  5. Mathys (2017, A&A, 601, A14): **51%** (43)
- There is no system known with an orbital period less than 1.5d

# CP stars in eclipsing binary systems

MNRAS **478**, 1749–1762 (2018)  
Advance Access publication 2018 May 02

doi:10.1093/mnras/sty1118

## HD 66051: the first eclipsing binary hosting an early-type magnetic star

O. Kochukhov,<sup>1★</sup> C. Johnston,<sup>2</sup> E. Alecian,<sup>3</sup> G. A. Wade<sup>4</sup> and the BinaMIcS collaboration

See poster: Paunzen et al.

MNRAS **487**, 4230–4237 (2019)  
Advance Access publication 2019 June 03

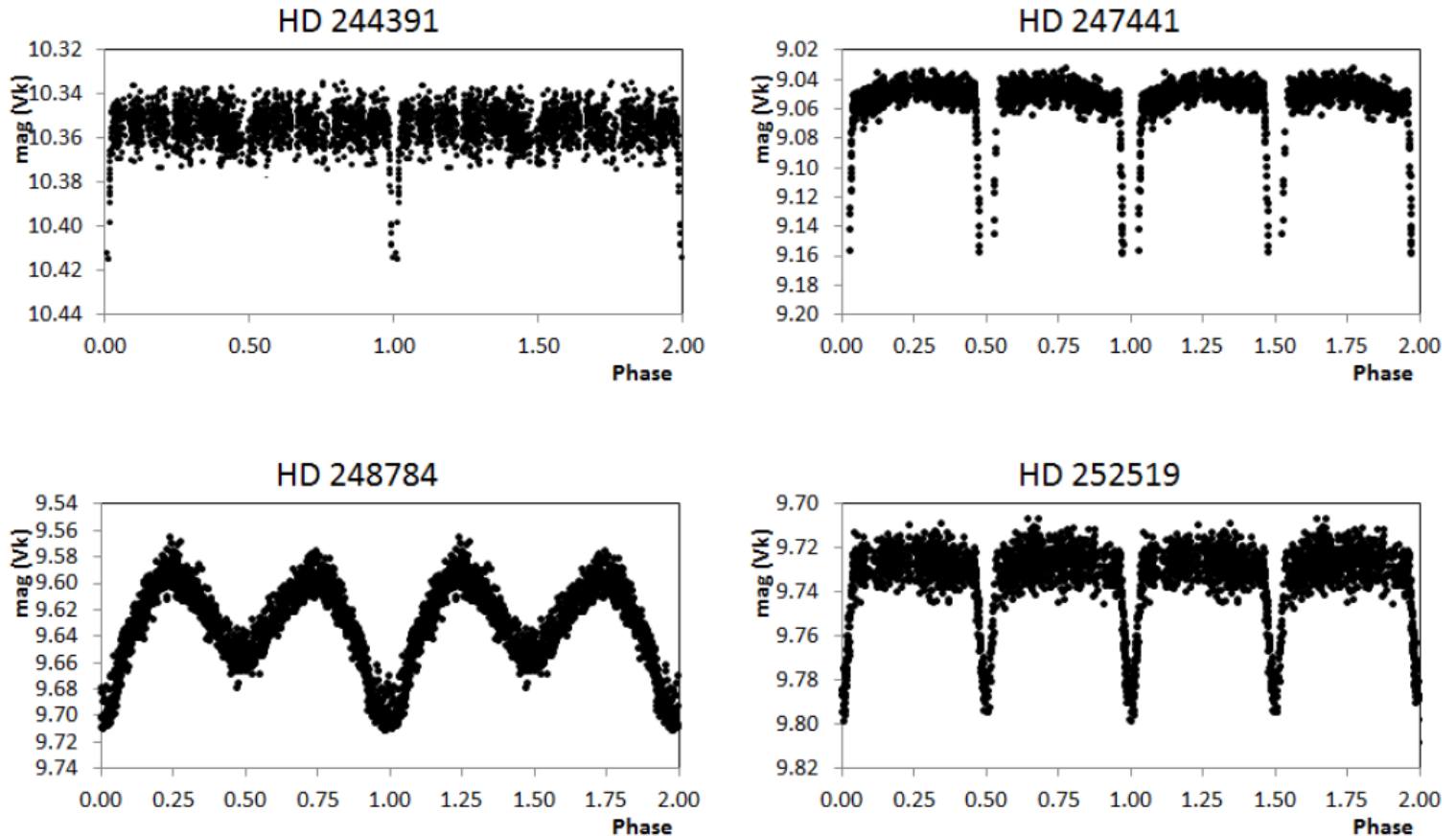
doi:10.1093/mnras/stz1478

## HD 99458: First time ever Ap-type star as a $\delta$ Scuti pulsator in a short period eclipsing binary?

M. Skarka<sup>1,2★</sup>, P. Kabáth,<sup>2★</sup> E. Paunzen<sup>1</sup>, M. Fedurco,<sup>3</sup> J. Budaj,<sup>4</sup> D. Dupkala,<sup>2,5</sup> J. Krtička,<sup>1</sup> A. Hatzes,<sup>6</sup> T. Pribulla,<sup>4</sup> Š. Parimucha,<sup>3</sup> Z. Mikulášek,<sup>1</sup> E. Guenther,<sup>6</sup> S. Sabotta,<sup>6</sup> M. Blažek<sup>1,2</sup>, J. Dvořáková,<sup>2,7</sup> L. Hambálek<sup>4</sup>, T. Klocová,<sup>2</sup> V. Kollár,<sup>4</sup> E. Kundra,<sup>4</sup> M. Šlechta<sup>2</sup> and M. Vaňko<sup>4</sup>

See poster: Skarka et al.

# CP stars in eclipsing binary systems



**Figure 5.** The KELT light curves of the eclipsing binaries HD 244391, HD 247441, HD 248784 and HD 252519, folded on the orbital periods of, respectively,  $P_{\text{orb}} = 6.0783(4)$  d,  $P_{\text{orb}} = 4.26756(5)$  d,  $P_{\text{orb}} = 0.81821(1)$  d and  $P_{\text{orb}} = 3.07948(2)$  d.



# What needs to be done?

- Search for **EBs** in CoRoT, Kepler, and TESS with a **primary** on the **upper main sequence** and **spots**
- Search for **short orbital spectroscopic binaries** with a magnetic CP component
- **Spectropolarimetric measurements** of known systems to find new magnetic CP components

**Thank you for your attention**