Peter De Cat

- Personalia
  - ➔ Date of Birth: 19/06/1974
  - ➔ Sex: male (he/him)
  - ➔ Martial status: married (Titia Phalet)
  - ➔ Children: Sien De Cat (29/01/2004)
    Nele De Cat (19/02/2007)
    Lore De Cat (19/02/2007)
  - ➔ E-mail: Peter.DeCat@oma.be
  - ➔ Telephone: +32 2 3736785

H-index: 41
- 112 papers in international refereed journals (7)
- 4 papers in international non-refereed journals
- 88 papers in proceedings of international conferences (21)

© Peter De Cat

© Nele, Sien & Lore De Cat (01/07/2021)

Career

- # Studies

  - ➔ 1992-1996: Master in Science (Physics) @ KU Leuven (Leuven, Belgium)
    - ➢ "Analysis of the line profile variations of the β Cephei star β Crucis (HD11123)" (04/07/1996; supervisor: dr. Conny Aerts)

  - ➔ 01/10/1996-30/09/2001: PhD in Science (Physics) @ KU Leuven (Leuven, Belgium)
    - ➢ "An observational study of bright southern slowly pulsating B stars" (23/05/2001; supervisor: dr. Conny Aerts)

- # Employment

  - ➔ 01/10/2001-31/10/2003: Post-doc FWO @ KU Leuven (Leuven, Belgium)

  - ➔ 01/11/2003-now: Scientific staff @ ROB (Brussels, Belgium)
    - ➢ Asteroseismology (BAF-type pulsators on the main-sequence)
    - ➢ LAMOST (Large Sky Area Multi-Object Fiber Spectroscopic Telescope)
    - ➢ BINA (Belgo-Indian Network for Astronomy and astrophysics)
    - ➢ RUSTICCA (Revalorising the Ukkel Schmidt Telescope by Installing a CCD Camera)

Science

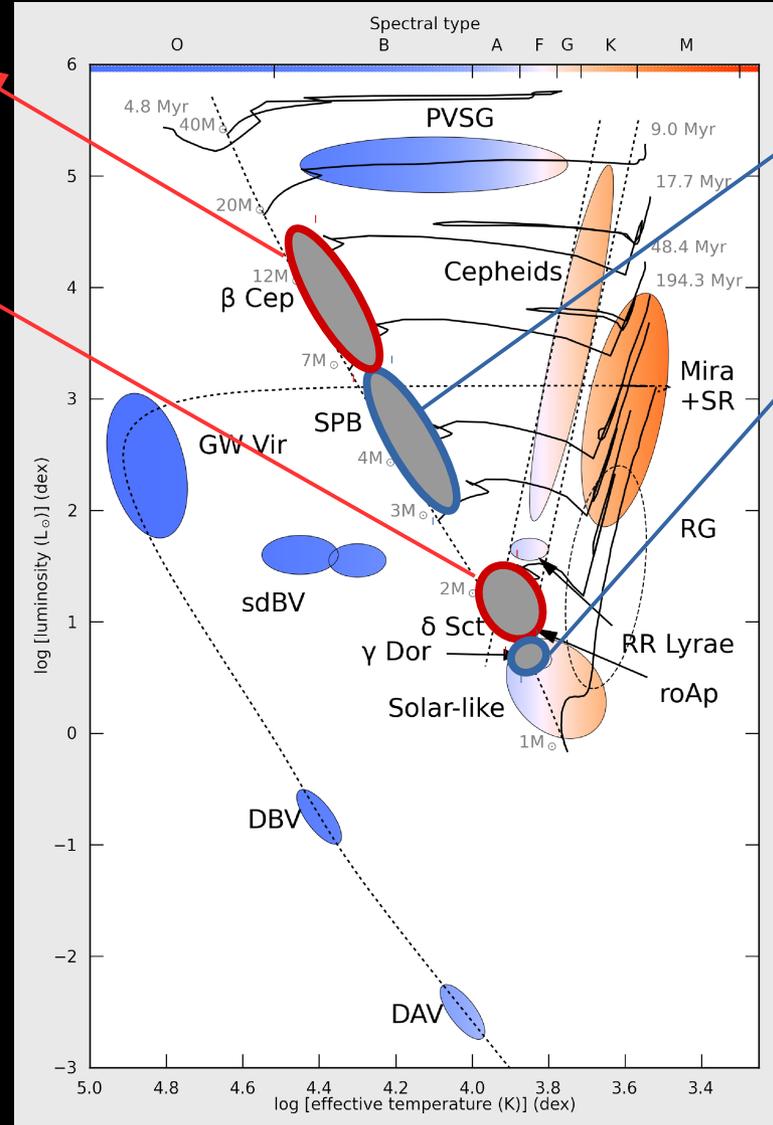- Asteroseismology (BAF-type mode pulsators on the main-sequence)

  → β Cephei (βCep) stars

  → δ Scuti (δSct) stars

  ↓

  p-modes

  - pressure
  - short periods
    - ✗ min to hours
  - near surface
  - radial displacements

  → Slowly pulsating B (SPB) stars

  → γ Doradus (γ Dor) stars

  ↓

  g-modes

  - buoyancy
  - long periods
    - ✗ hours to days
  - deep interior
  - tangential displacements

… and their hybrids

Science

- ## Asteroseismology (BAF-type mode pulsators on the main-sequence)

  ➔ Evidence for binarity and multiplicity in the β Cephei star β Crucis

  ➢ CAT/CES@ESO(LaSilla)/1.4-m

  Aerts, De Cat, Cuypers et al., 2000, A&A 329, 137

  ✗ high-resolution (R=60000), SiIII triplet (455.26, 456.78, 457,48 nm)
  ✗ time-series: 1193 spectra in 11 nights (1984-1995)
  ✗ isolated observations: 14 spectra in 14 nights (1996-1997)

Multiperiodic pulsator
 - f_1 = 5.2305468 d^{-1} (l=1)
 - f_2 = 5.958666 d^{-1} (l≥3)
 - f_3 = 5.472165 d^{-1} (l≥3)
   (moment method)
Single-lined binarity
 - P_{orb} = 1828.0(25) days
 - e = 0.38(9)
 - B2V secondary

β Crucis, 1989
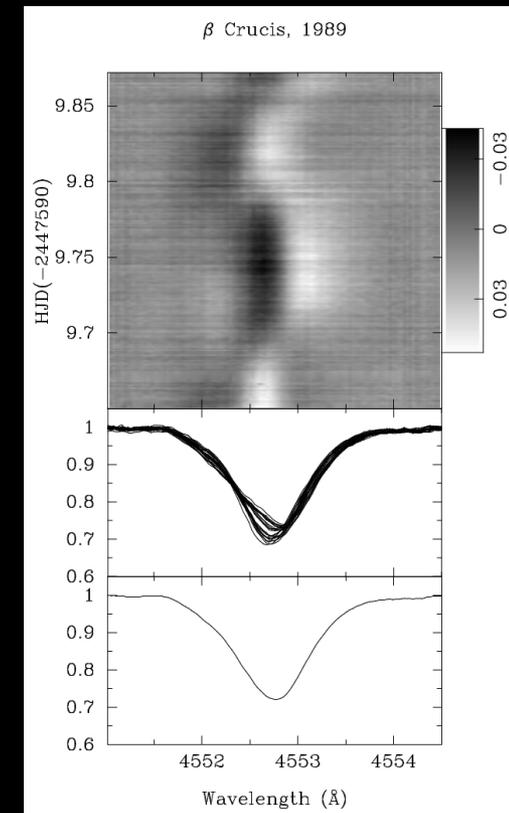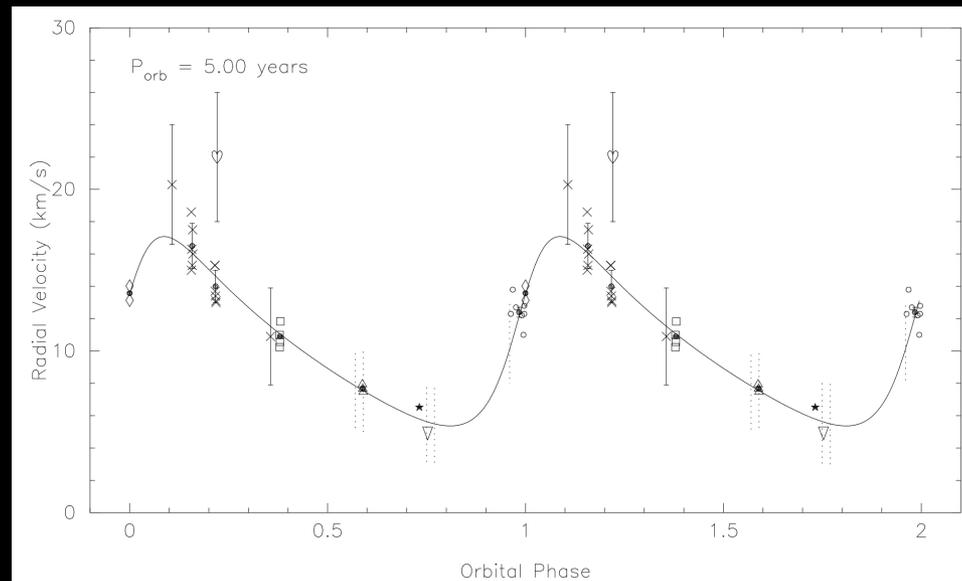
  ➔ Polarimetric detection of non-radial oscillation modes in the β Cephei star β Crucis

Cotton, Buzasi, Aerts et al., 2021, NatAst, in press

Science

- Asteroseismology (BAF-type mode pulsators on the main-sequence)
  - ➔ A detailed spectroscopic analysis of ε Per
    - I. Determination of the orbital parameters and of the frequencies
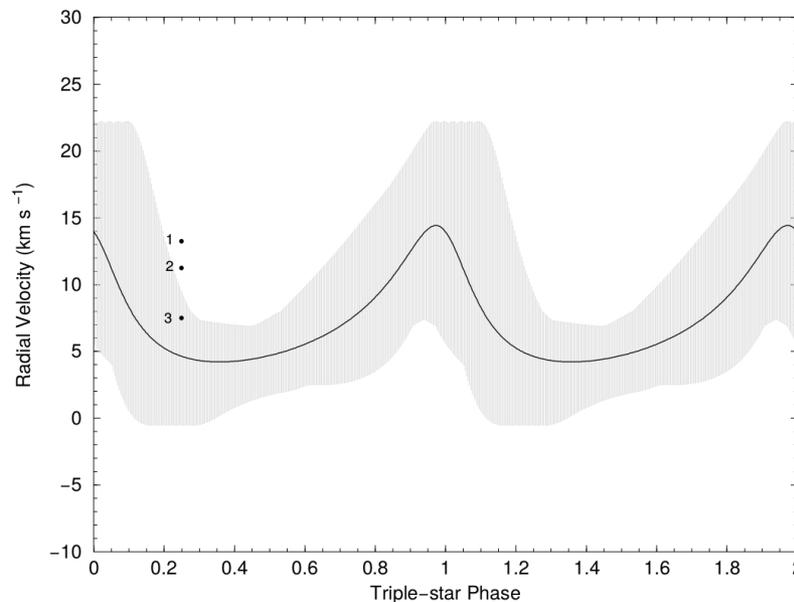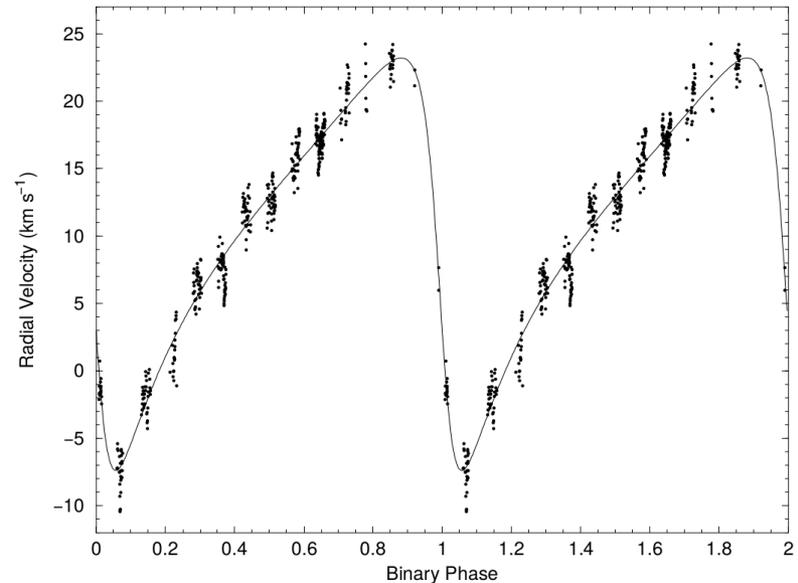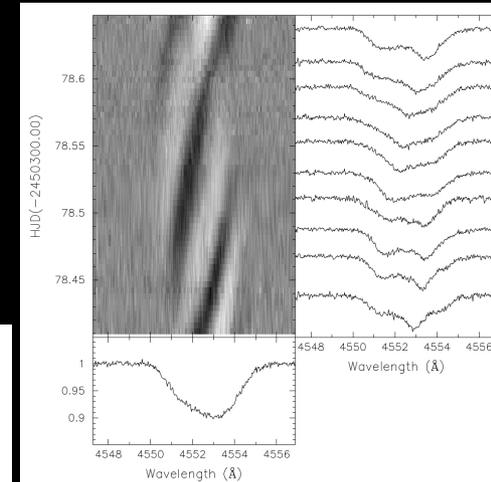   - ➢ Aurélie@OHP/1.52-m   De Cat, Telting, Aerts, Mathias, 2000, A&A 359, 539
        - ✗ high-resolution (R=60000), SiIII triplet (455.26, 456.78, 457,48 nm)
        - ✗ time-series: 464 spectra in 14 consecutive nights (16-29/10/1996)

Triple system (Tarasov et al. 1995)
 - 14.0 days of inner binary confirmed
 - 1456 days of triple system non-conclusive

Multiperiodic pulsator
 - $f_1 =$ 5.300 d^{-1}
 - $f_2 =$ 5.890 d^{-1}
 - $f_3 =$ 6.250 d^{-1}
 - $f_4 =$ 6.875 d^{-1}
 - $f_5 =$ 10.585 d^{-1}
 (moment method)

Science

- ## Asteroseismology (BAF-type mode pulsators on the main-sequence)

  - ➜ A study of bright southern slowly pulsating B stars

    I. Determination of the orbital parameters and of the main frequency of the
    spectroscopic binaries
    De Cat, Aerts, De Ridder et al., 2000, A&A 355, 1015

    II. The instrinsic frequencies
    De Cat & Aerts, 2002, A&A 393, 965

    III. Mode-identification for singly-periodic targets in spectroscopy

    De Cat, Briquet, Daszyńska-Daszkiewicz et al., 2005, A&A 432, 1013

    - ➢ Sample

      - ✗ 5 well-known SPBs (Waelkens, 1991)

      - ✗ 12 candidate SPBs (thanks to Hipparcos data)

    - ➢ Observations

      - ✗ Spectroscopy: high-resolution CAT/CES@ESO/1.4-m
        (SiII doublet: 412.8, 413.0 nm)

      - ✗ Photometry: Geneva photometry (U, B_1, B, B_2, V_1, V, G)

        Hipparcos photometry (H_p)

    - ➢ Analysis
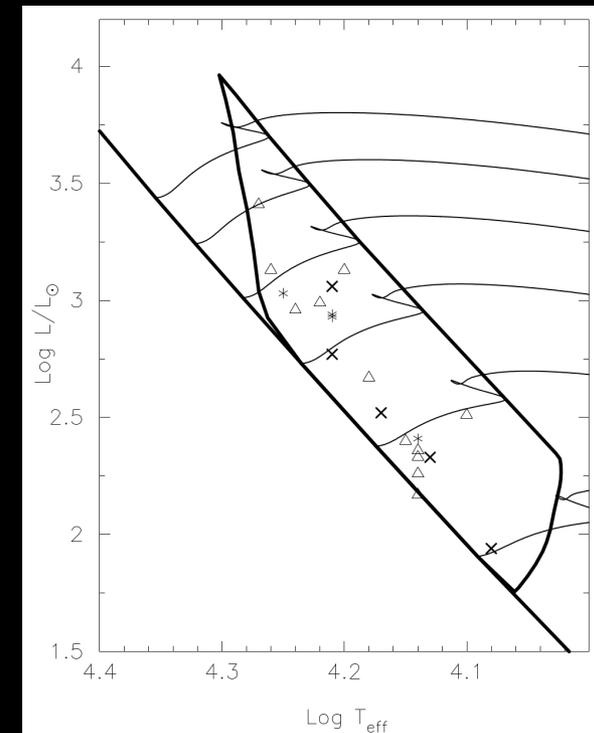
      - ✗ Frequency analysis }
      - ✗ Mode identification }   Observational characterisation
                                    of class of SPB stars

        - ✔ moment method and photometric amplitude ratios

Science

- ## Asteroseismology (BAF-type mode pulsators on the main-sequence)
  - ➔ A spectroscopic study of southern (candidate) γ Doradus stars
    - I. Time series analysis

    - ➢ CORALIE@Euler/1.2-m
      - ✗ high-resolution spectroscopy (cross-correlation profiles)

      10 new bona fide γDor stars
      1 new bona fide δSct star
      8 constant stars

	bf γ Dor star		cand γ Dor star		rejected γ Dor star	
single	13	HD 12901, HD 14940, HD 27290, HD 40745, HD 41448, HD 48501, HD 65526, HD 112685, HD 135825, HD 149989, HD 187025, HD 216910, HD 218225	2	HD 110379, HD 112934	4	HD 7455, HD 22001, HD 33262, HD 125081[1]
suspect	0		2	*HD 111829, HD 26298*	1	HD 27604
SB1	2	*HD 167858[2], HD 209295*	1	*HD 126516*	1	HD 85964
SB2	1	*HD 34025*	7	*HD 10167, HD 27377[3], HD 35416 HD 110606, HD 111709[3,4], HD 147787, HD 214291*	3	HD 5590, HD 8393, HD 81421

[1] bf δ Sct star; [2] shows no cross-correlation profile variations but was classified as a bf γ Dor star before; [3] ellipsoidal variability instead of pulsation cannot be ruled out; [4] shows cross-correlation profile variations, but was classified as a chemically peculiar star before.

Science

- Asteroseismology (BAF-type mode pulsators on the main-sequence)
    - ➜ Long term photometric monitoring with the Mercator telescope
      Frequencies and mode identification of variable O-B stars
        - ➤ P7@Mercator/1.2-m
            - ✗ Geneva photometry (U, B_1, B, B_2, V_1, V, G)
        - ➤ Hipparcos photometry (H_p)

De Cat, Briquet, Aerts et al., 2007, A&A 463, 243

l = 1, 2, 3, 4

dominance of l=1 modes
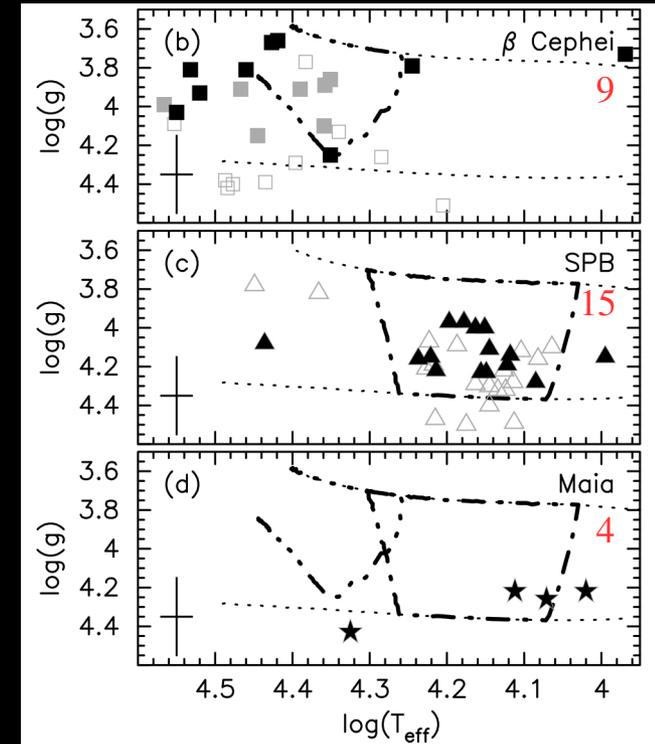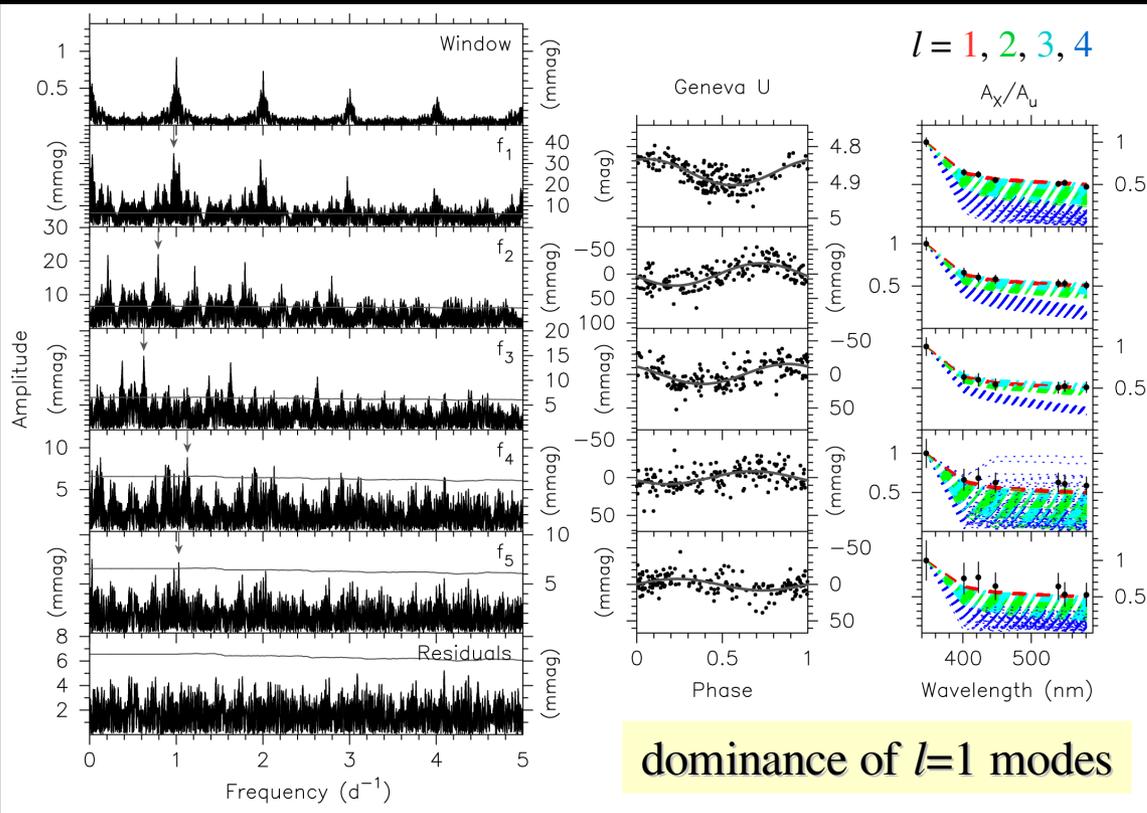
21 pulsating variables (7 new, 2 candidate hybrids)
6 non-pulsating variables (binary or spotted star)
1 photometrically constant

Science

- ## Asteroseismology (BAF-type mode pulsators on the main-sequence)

  - ➔ Long term photometric monitoring with the Mercator telescope
    Frequencies and mode identification of variable O-B stars

    De Cat, Briquet, Aerts et al., 2007, A&A 463, 243

    Frequencies and multicolour amplitudes of γ Doradus stars

    Cuypers, Aerts, De Cat et al., 2009, A&A 499, 967

Science

- Asteroseismology (BAF-type mode pulsators on the main-sequence)

  ➔ Rotation and pulsations in main-sequence gravity mode pulsators

  SPB stars
  γDor stars

  effect of rotation on pulsations? {
  - ➤ isolated spectra for *v*sin*i* determination
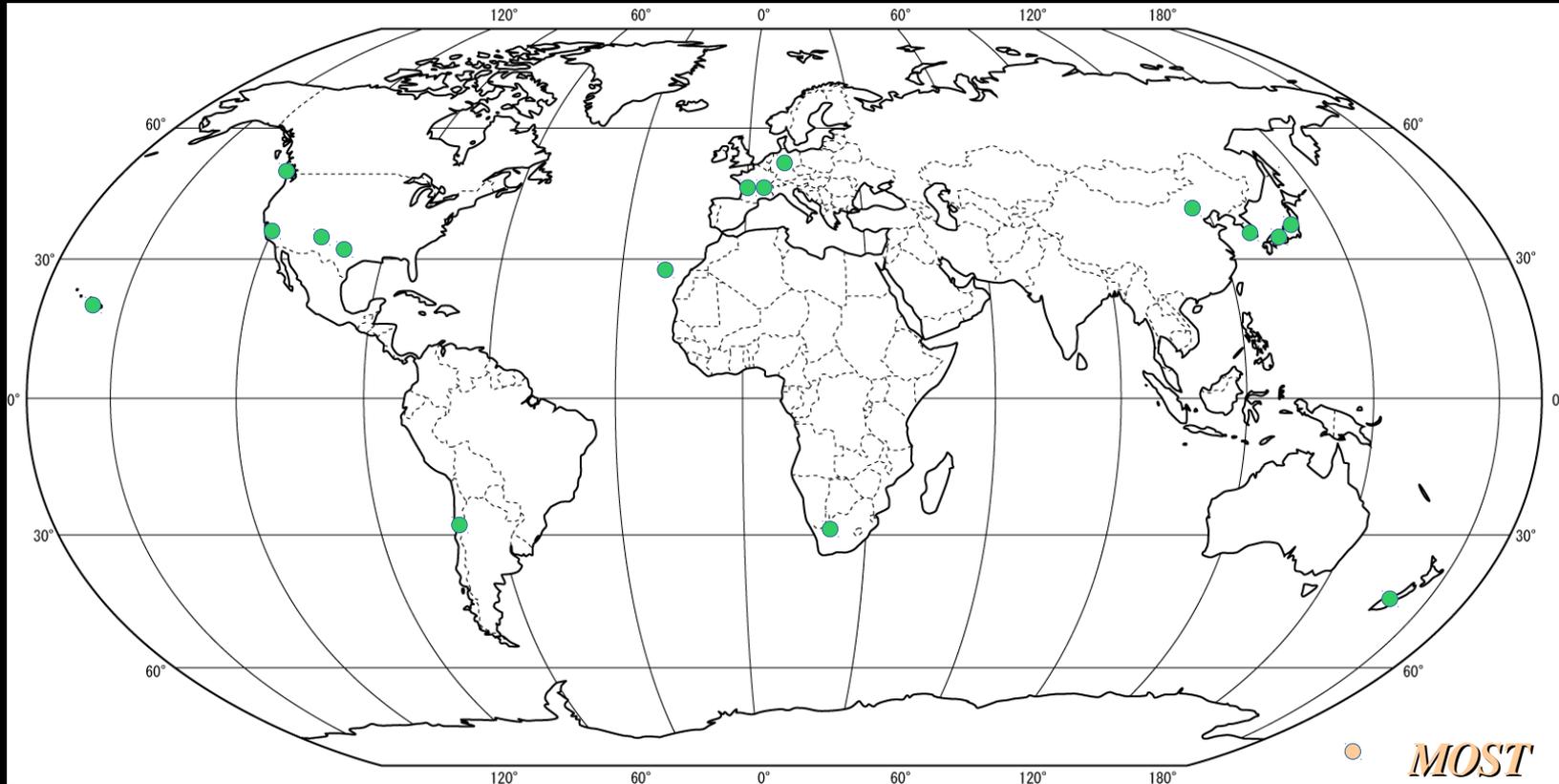 - ➤ spectroscopic multi-site campaignes
    - ✗ 16 ground-based observatories
    - ✗ >11,000 high-resolution spectra

  Action 1 project (2008-2011): Duncan J. Wright

  Action 1 project (2012-2014): Ádám Sódor

  De Cat, Wright, Pollard et al., 2009, AIPC 1170, 480

ESPaDOnS@CFHT/3.58-m
Hamilton@Lick/3-m
9682M@DAO/1.2-m
RA2@McDonald/2.1-m
Echelle@Fairborn/2-m
HARPS@ESO/3.6-m
FEROS@ESO/2.2-m
FIES@RMO/2.6-m
HERMES@RMO/1.2-m
SOPHIE@OHP/1.93-m
NARVAL@TBL/2-m
CES@TLS/2.0-m
GIRAFFE@SAAO/1.9-m
COUDE@Xinglong/2.16-m
BOES@BOA/1.8-m
HIDES@OAO/1.88-m
HERCULES@MJUO/1.0-m

21 days HD25558 (SPB)
47 days HD218396 (γDor)

MOST

- Asteroseismology (BAF-type mode pulsators on the main-sequence)
  - ➔ Rotation and pulsations in main-sequence gravity mode pulsators SPB stars / γDor stars
    - ➢ HD218396 (HR8799; γDor star; planet host)
      - ✗ spectroscopy: SOPHIE@OHP/1.93-m

   Wright, Chené, De Cat et al., 2011, ApJL 728, L20

        misalignment stellar rotational inclination and planetary orbit axis

        - ✔ 650 spectra in time span of 2 weeks
        - ✔ frequency analysis → f_1 = 1.9875 d^{-1}
        - ✔ mode identification (pixel-by-pixel method) → prograde sectoral mode (l,m) = (1,+1), i_{rot} > 40°

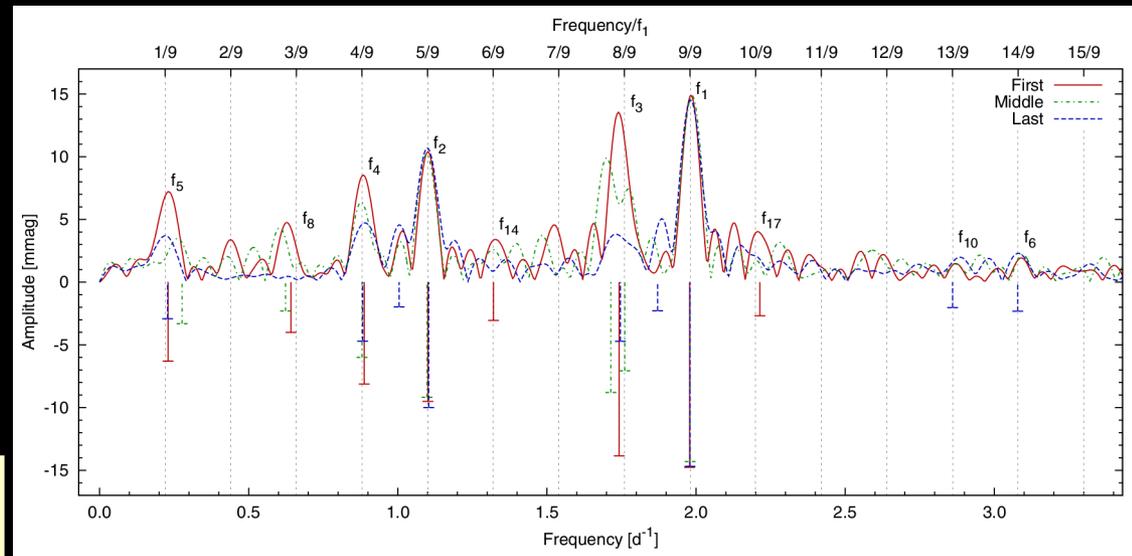   Sódor, Chené, De Cat et al., 2014, A&A 568, A106

      - ✗ photometry: Microvariability and Oscillations in STars
        - ✔ frequency analysis → f_1 = 1.978 d^{-1}
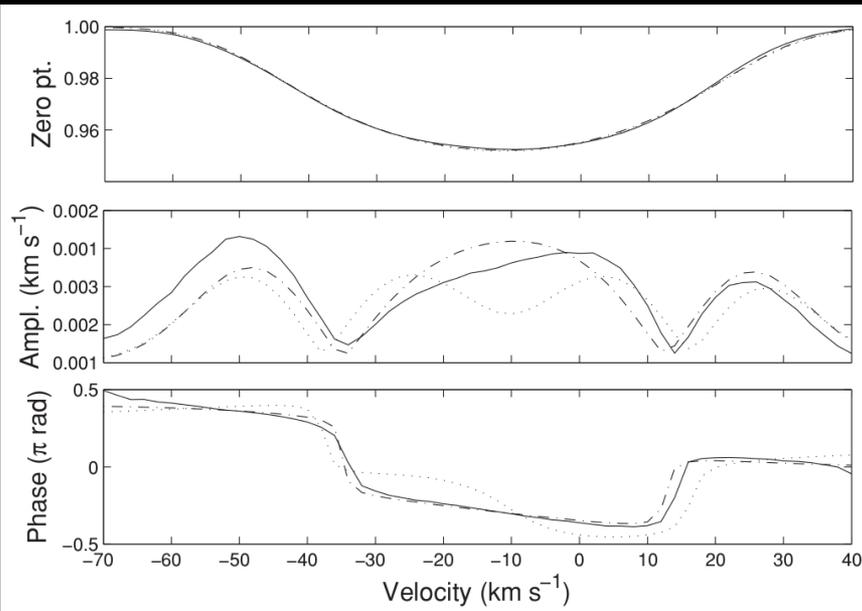
many multiples of f_1/9
strong amplitude decrease and phase changes

Science

- # Asteroseismology (BAF-type mode pulsators on the main-sequence)

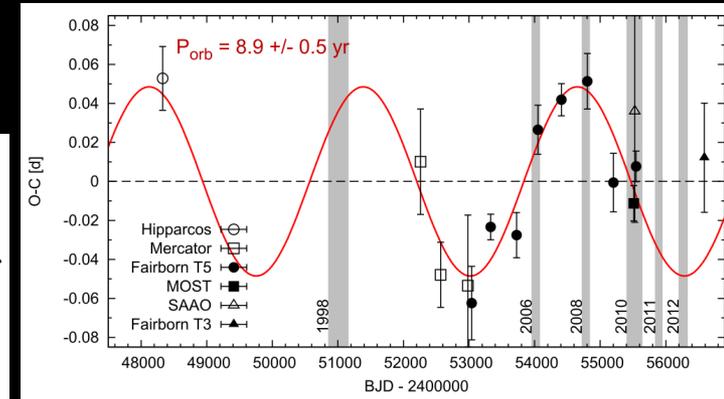 ➔ ## Rotation and pulsations in main-sequence gravity mode pulsators
  SPB stars
  γDor stars

  ➢ ### HD25558 (SPB star)

  Sódor, De Cat, Wright et al., 2014, MNRAS 438, 3535

  ✗ spectroscopy: ~2000 high-resolution spectra

  ✗ photometry: ground-based and MOST lightcurves

  - double-lined spectroscopic binary
    (P_{orb} ~ 9 years)
  - both components SPB stars
    (11 independent frequencies)
  - inclination and rotation of
    two components differ
  - magnetic field for secondary
    (few hundred Gauss)
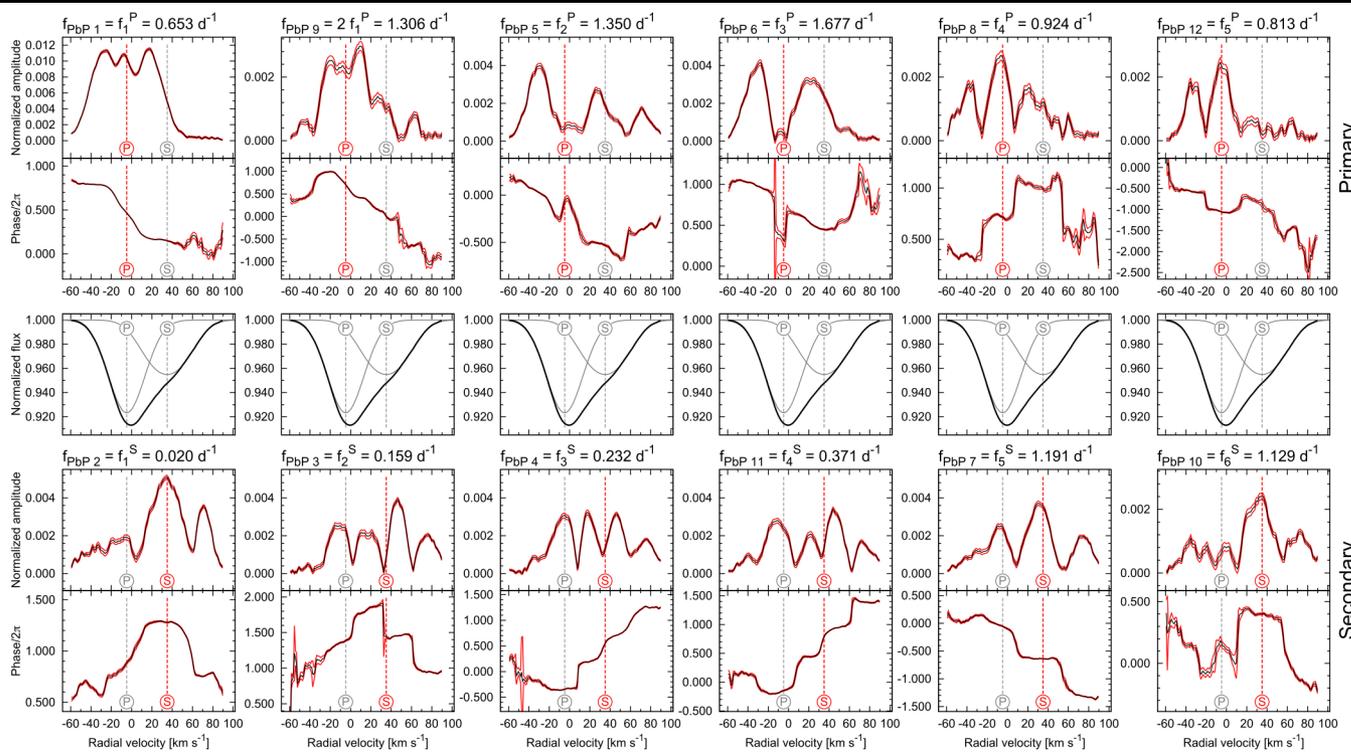
  ➔ ## Gravity-mode Asteroseismology of Stars with a convective core (GAS)

  collaboration with Timothy Van Reeth (KU Leuven)

Science

- LAMOST (Large Sky Area Multi-Object Fiber Spectroscopic Telescope)

  - Specifications:

    - Fibers: #4000

    - Telescope: 4.0-m Guo Shou Jing Telescope
   northern hemisphere (Xinglong Observatory, China)

    - Wavelengths: 370 – 900 nm

    - Resolution: 1000-2000 (low) / 5000-10000 (medium)

    - Field of View: ~20 deg² (5°; circular)

    - Targets: >5,000,000 (stars, galaxies, QSOs)

    - Science case:

      - LEGAS: LAMOST Extragalactic Survey

      - LEGUE: LAMOST Experiment for Galactic Understanding and Exploration
        → survey of Milky Way stellar structure (halo and disk components)
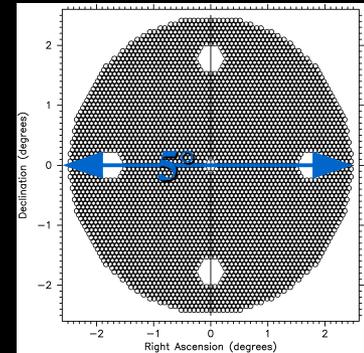
- test observations LRS (R~1800)   → May-June 2011
- pilot survey LRS   → October 2011-June 2012
- first regular survey LRS   → October 2012-June 2017
- test observations MRS (R~7500)   → October 2018-June 2019
- second regular survey LRS + MRS   → June 1019-now

Science

- # LAMOST (Large Sky Area Multi-Object Fiber Spectroscopic Telescope)
  - → *Kepler* mission
    - ➢ primary mirror: 1.2-m
    - ➢ lifetime: 07/03/2009–14/05/2013
    - ➢ continuous monitoring 1 star field in Cygnus-Lyra region
      - ✗ about 200,000 stars
      - ✗ roll 90° about line-of-sight months
      - ✗ short (1 min.) or long (32 min.) cadence
      - ✗ broad band photometry with accuracy ppm
    - ➢ main scientific goals
      - ✗ discover Earth-size planets (transit method)
      - ✗ characterizing planet-hosting stars by means of asteroseismic methods
      - ✗ opportunity for asteroseismic investigation of stars covering H-R diagram
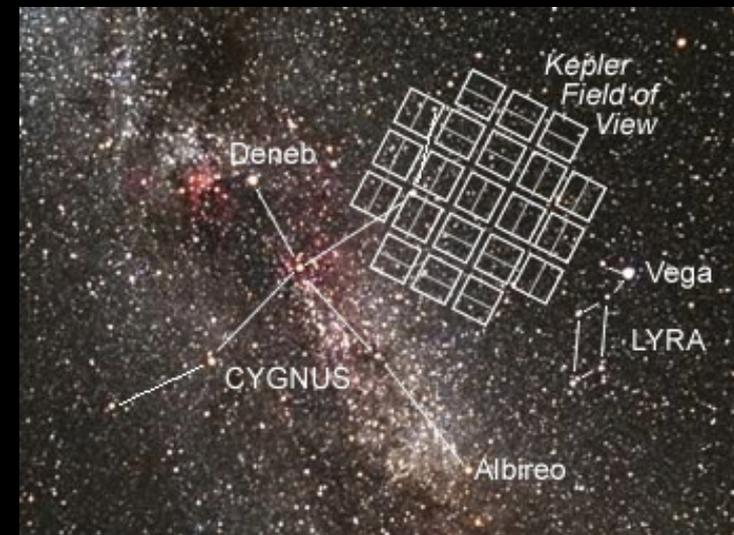
Goldmine for asteroseismic studies (Kepler Asteroseismic Science Consortium)

Science

- LAMOST (Large Sky Area Multi-Object Fiber Spectroscopic Telescope)
    - → LRS LAMOST Observations in *Kepler* Field
        - ➢ to cover whole Kepler field-of-view
        - ➢ to characterize targets in homogeneous way
            - ✗ Teff, logg, metallicity
            - ✗ spectral type
            - ✗ any peculiarities
        - ➢ with low resolution spectroscopy
        - ➢ radial velocity $\Rightarrow$ cluster membership, binaries
        - ➢ rotation velocity $\Rightarrow$ restriction on $v\sin i$
        - ➢ because it is the only instrument to observe thousands of targets efficiently
            - ✗ brightest targets ($K_p \leq 10.5$): 2-m class telescopes
            - ✗ LAMOST: focus on fainter targets

Win-win proposal for:
- *Kepler* asteroseismic community (provide stellar parameters)
- LAMOST community (calibration of results)
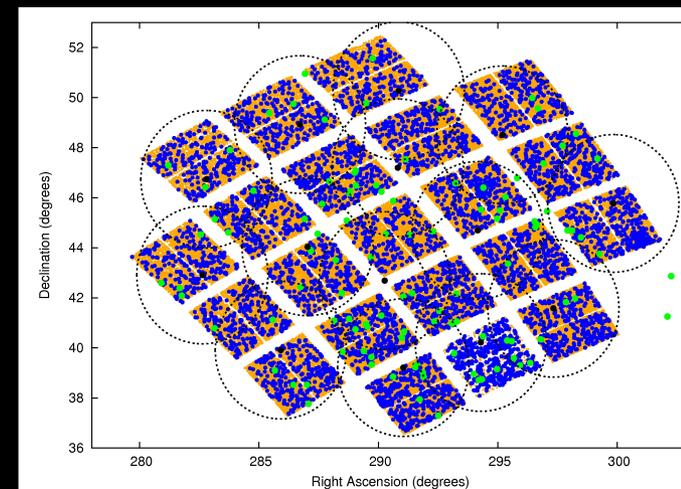
大天区面积多目标光纤光谱望远镜
（LAMOST）
科学试观测计划建议书

Characterization of targets of the Kepler Asteroseismic Science Consortium (KASC)

课题名称：
申请者：Peter De Cat
工作单位：Royal Observatory of Belgium
通讯地址：Ringlaan 3
邮政编码：B-1180 Brussels (Belgium)
电子信箱：Peter.DeCat@oma.be
电 话：+32 2 3736785
传 真：+32 2 3749822
February 2010

Science

- # LAMOST (Large Sky Area Multi-Object Fiber Spectroscopic Telescope)
  - ➜ ## LRS LAMOST Observations in *Kepler* Field
    - I. De Cat, Fu, Ren et al., 2015, ApJS 220, 19
    - II. Zong, Fu, De Cat et al., 2018, ApJS 238, 30

38.2% of Kepler stars observed
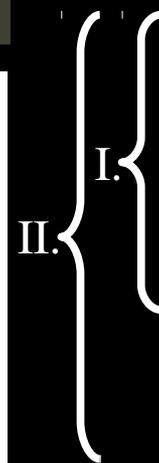
Year	#Fields	#Plates	#Spectra
2011			
2012	3	7	17,659
2013	6	14	39,309
2014	7	14	38,516
2015	11	32	97,247
2017	6	16	35,139
total	33	83	227,870

	#Objects	#Parameters
Total	227870	173971
Unique	104887	89570
2×	37482	28077
3×	10552	6613
4×	2293	1429
+5×	1176	483

Science
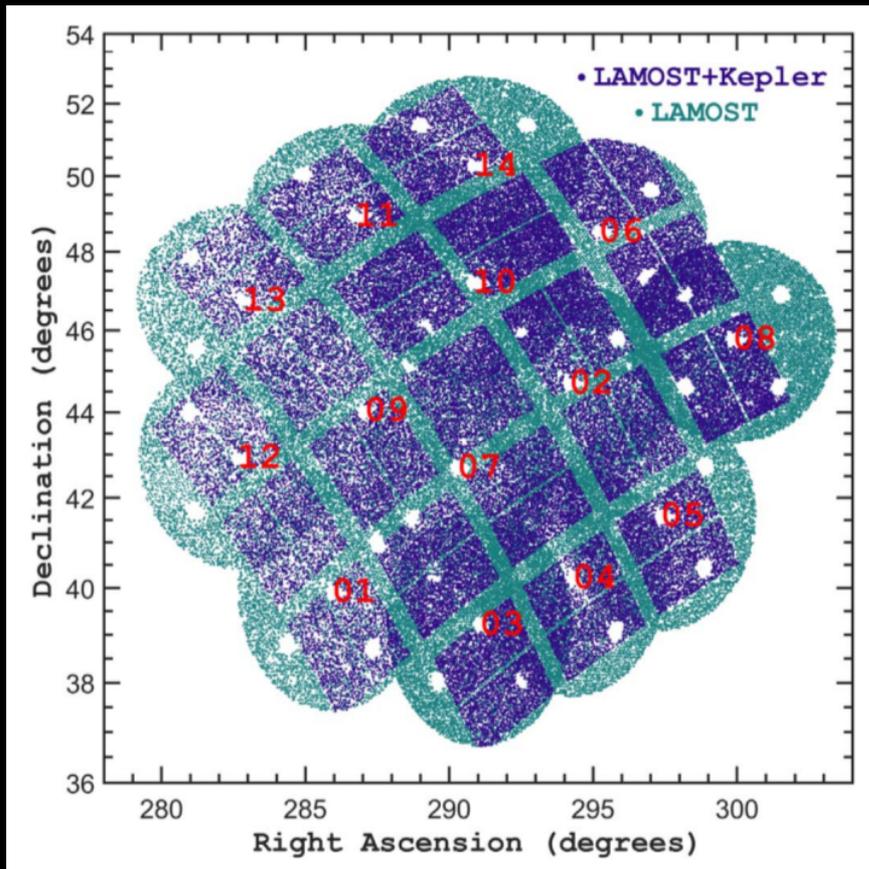
- LAMOST (Large Sky Area Multi-Object Fiber Spectroscopic Telescope)

  → LRS LAMOST Observations in *Kepler* Field

    ➤ Asian group

      Ren, Fu, De Cat et al., 2016, ApJS 225, 28

      ✗ determination stellar parameters
        ✔ T_{eff} (2.75%), log$g$ (0.215 dex), [Fe/H] (0.152 dex), v_{rad} (18 km/s)
      ✗ calibration of stellar parameters

      results based on code LASP (LAMOST Stellar Parameter pipeline)

      115 stars [Fe/H] < -1.0 dex
      18 stars v_{rad} < -300 km/s

    ➤ European group

      Frasca, Molenda-Żakowics, De Cat et al., 2016, A&A 594, A39

      ✗ determination stellar parameters
        ✔ T_{eff} (3.5%), log$g$ (0.3 dex), [Fe/H] (0,2 dex), v_{rad} (14 km/s)
        ✔ $v$sin$i$ (>120 km/s)
      ✗ search for active stars (filling Hα & CaII IRT)

      results based on code ROTFIT

      442 active stars
      accreting star KIC8749284 (K1V)

    ➤ American group

      Gray, Corbally, De Cat et al., 2016, AJ 151, 13

      ✗ classification on MK system (direct comparison MK standards)
        ✔ temperature type (0.6), luminosity class (0.5)
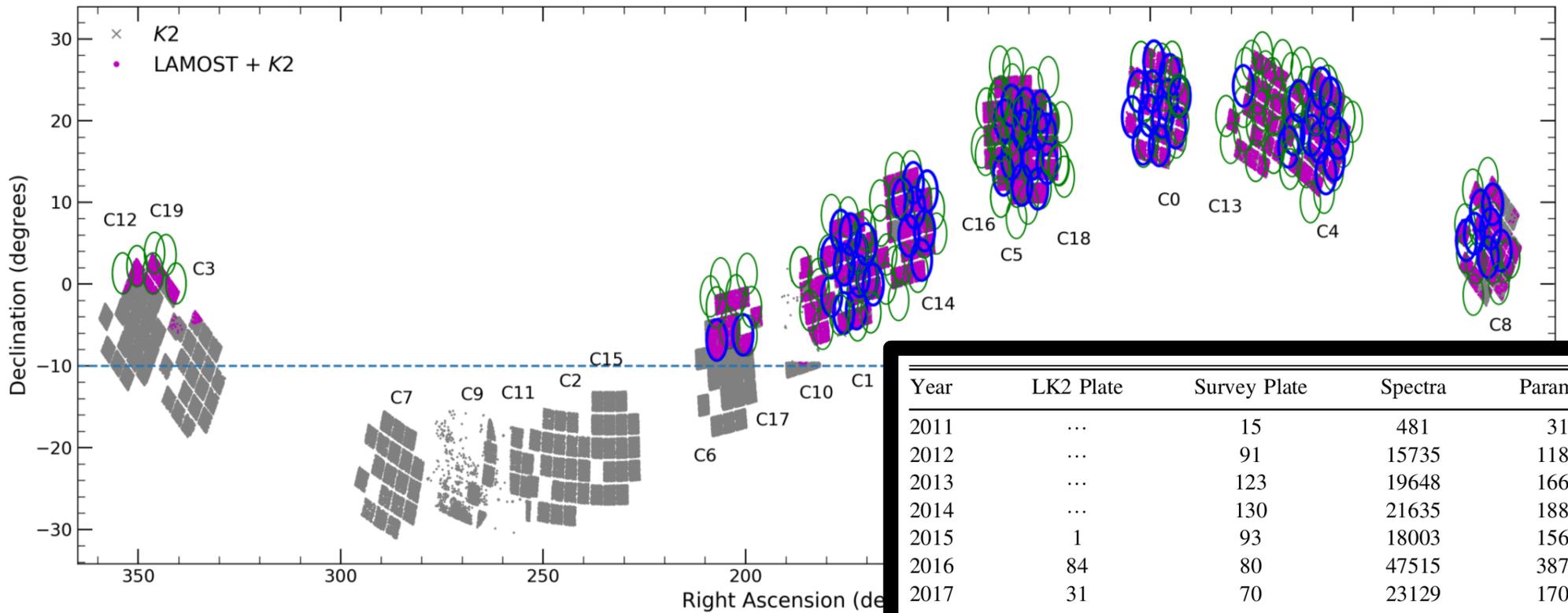   ✗ identification of peculiar and astrophysically interesting stars

      results based code MKCLASS

      32 Barium dwarfs
      34.6% of A stars are Am
      132 λ Bootis stars

Science

- ## LAMOST (Large Sky Area Multi-Object Fiber Spectroscopic Telescope)
  - → LRS LAMOST Observations in *K2* Fields   Wang, Fu, Zong et al., 2020, ApJS 251, 27

Year	LK2 Plate	Survey Plate	Spectra	Parameter
2011	…	15	481	312
2012	…	91	15735	11874
2013	…	123	19648	16616
2014	…	130	21635	18849
2015	1	93	18003	15673
2016	84	80	47515	38758
2017	31	70	23129	17037
2018	10	50	14473	10855
Total	126	652	160619	129974

Visits		Sources	Parameter
1×		48280	41634
2×		20877	17445
3×		8392	6827
4×		3404	2753
+5×		3059	2236

- ➤ 19 campaigns in ecliptic plane
  - ✗ continuous observations for ~80 days
  - ✗ lifetime: 08/03/2014–26/09/2018

Science

- ## LAMOST (Large Sky Area Multi-Object Fiber Spectroscopic Telescope)

  - ➔ MRS LAMOST Observations in the *Kepler/K2* Fields

    - ✗ initiated in 2018

    - ✗ collecting ~60 MRS LAMOST spectra for >50,000 in period of 5 yr (09/2018-06/2023)

    - ➤ Asian group (LASP)   Zong, Fu, De Cat et al., 2020, ApJS 251, 15

      - ✗ observations 10/2018-01/2019 *Kepler* + *K2* fields (first year second regular survey)

        - ✔ ~259,000 spectra of 21,053 targets

        - ✔ T_{eff} (100K), log$g$ (0.15 dex), [Fe/H] (0.09 dex), v_{rad} (1 km/s)

Science

- LAMOST (Large Sky Area Multi-Object Fiber Spectroscopic Telescope)
  - → MRS LAMOST Observations in the *Kepler/K2* Fields
    - ✗ initiated in 2018
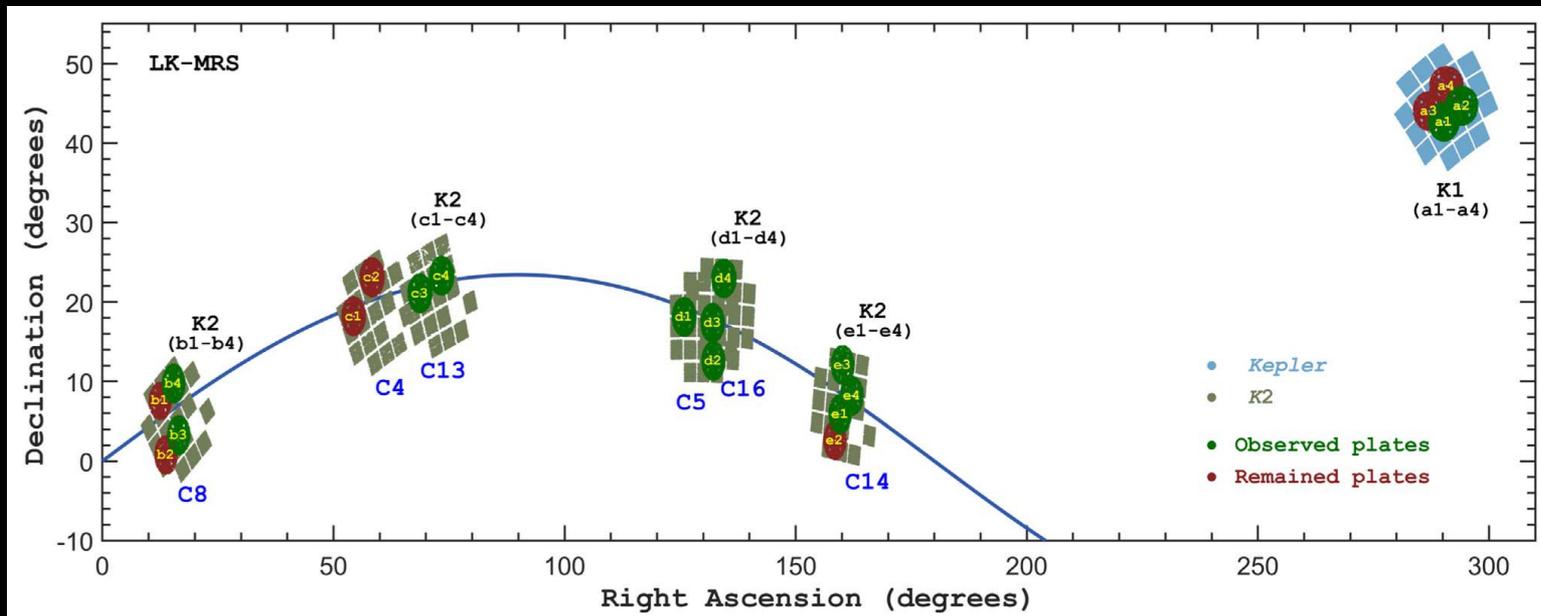   - ✗ collecting ~60 MRS LAMOST spectra for >50,000 in period of 5 yr (09/2018-06/2023)

    - ➢ Asian group (LASP)   Zong, Fu, De Cat et al., 2020, ApJS 251, 15
      - ✗ observations 10/2018-01/2019 *Kepler + K2* fields (first year second regular survey)
        - ✔ ~259,000 spectra of 21,053 targets
        - ✔ T_{eff} (100K), log$g$ (0.15 dex), [Fe/H] (0.09 dex), v_{rad} (1 km/s)

    - ➢ European group (ROTFIT)   Frasca, Molenda-Żakowics, Alonso-Santiago et al., to be submitted
      - ✗ observations 10/2017-06/2018 *Kepler* field (test phase MRS spectrographs)
        - ✔ ~14,300 spectra of 7,443 targets
        - ✔ T_{eff} (2.5%), log$g$ (0.25 dex), [Fe/H] (0.15 dex), v_{rad} (3 km/s)
   - ✔ $v$sin$i$ (>8 km/s)

> 327 active stars
> EW measurement LiI λ6708 line for 1657 stars
> - 187 Li-rich giants (153 new ones)
> - fraction of 4-5% Li-rich giants
> - no relation between rotation and Li abundances (~~merging scenarios~~)

Science

- LAMOST (Large Sky Area Multi-Object Fiber Spectroscopic Telescope)
  - ➔ LRS LAMOST Observations in *Kepler* Field
    - ➢ Workshops
      - ✗ 1st LAMOST-Kepler workshop
        - ✔ *"first results of LAMOST-Kepler project"*
        - ✔ *18/08-22/08/2014 (Beijing, China)*
      - ✗ 2nd LAMOST-Kepler workshop
        - ✔ *"LAMOST in the era of large spectroscopic surveys"*
        - ✔ *31/07-03/08/2017 (Brussels, Belgium)*
    - ➢ Award
      - ✗ LAMOST invited professor in 2018
        (Chinese Academy of Sciences of China)
        - ✔ 1 week visit to National Astronomical Observatory of China (including 2 nights of observations with LAMOST)
        - ✔ 1 week visit to Beijing Normal Unversity

Beijing — 2014.08.18-22

2nd LAMOST-Kepler workshop
31/07-03/08/2017

Royal Observatory of Belgium - Brussels - Belgium
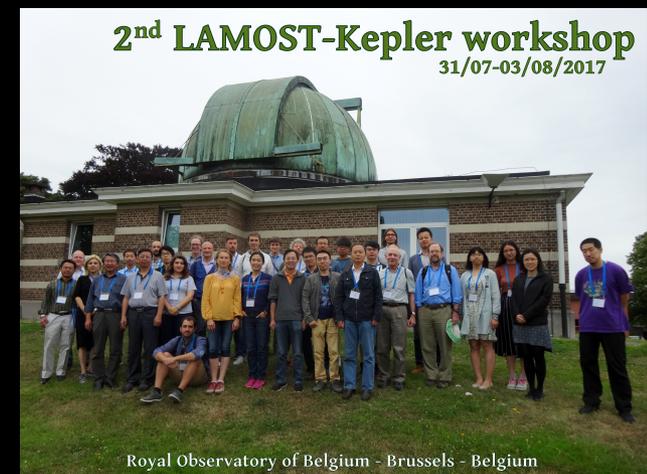
Science

- BINA (Belgo-Indian Network for Astronomy and astrophysics)

  → Devasthal observatory

➢ 3.6-m DOT (Devasthal Optical Telescope)

available {
  - ✗ IMAGER — optical imaging
  - ✗ TIRCAM2 — near-infrared imaging
  - ✗ ADFOSC — low-resolution spectroscopy + camera
  - ✗ TANSPEC — medium-resolution spectroscopy
}

7% Belgian time

expected {
  - ✗ HRS — high-resolution spectroscopy
  - ✗ fast photometer — multi-colour photometry
    - ✔ operational since 04/2017
}

➢ 4-m ILMT (International Liquid Mirror Telescope)

  - ✗ rotating container with liquid mercury
  - ✗ nominal phase: 5 years of scientific operations
    - ✔ first light expected after pandemic
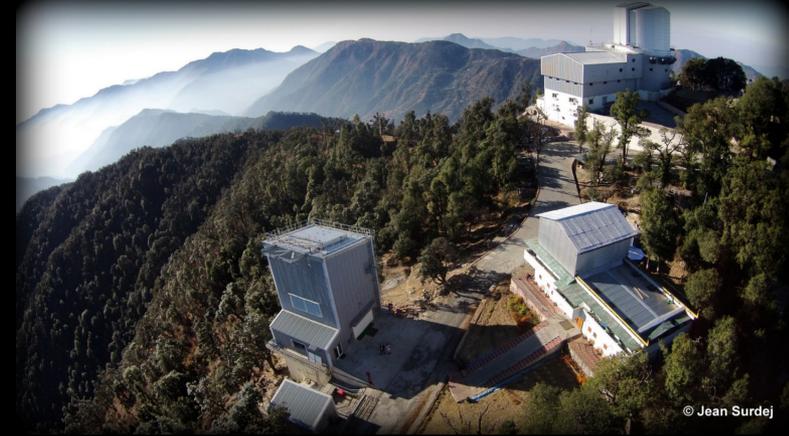
BINA (15/12/2014-15/12/2018; 2 Belgian and 7 Indian partner insitutes; focus: instrumentation)

BINA (01/01/2018-31/12/2022; 5(6) Belgian and 12 Indian partner insitutes; focus: science)

BIPASS (submitted; 4(6) Belgian and 5 Indian partner insitutes; focus: spectroscopy)

Science

- BINA (Belgo-Indian Network for Astronomy and astrophysics)
  - → ORBIT (Optical characterisation and Radial velocity monitoring with Belgian and Indian Telescopes)

    Joshi, De Cat, Panchal et al., 2019, BSRSL 88, 82

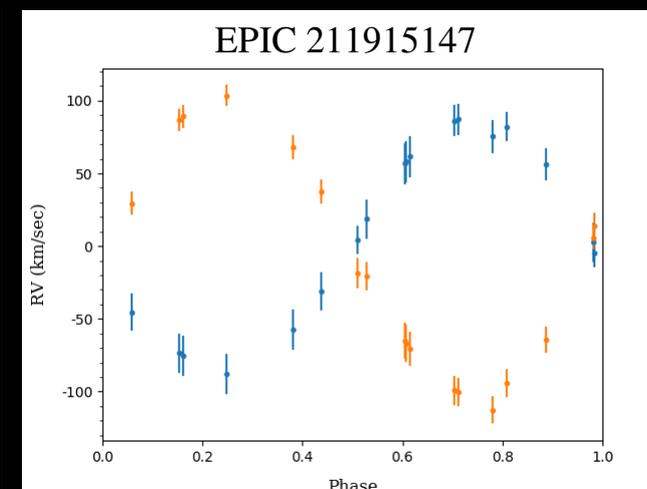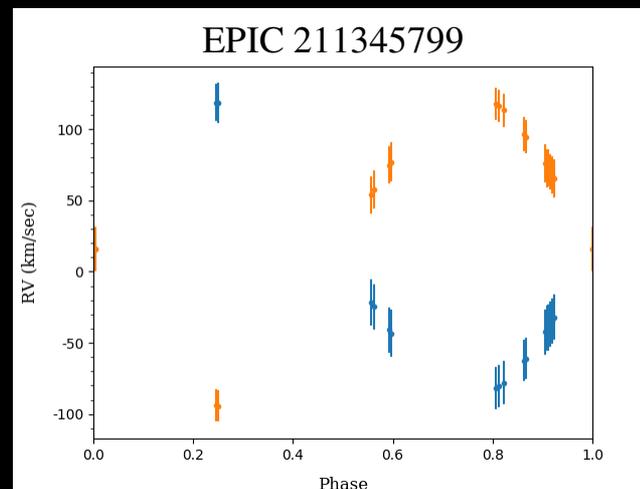   - ➢ study of exoplanet and eclipsing binary candidates
      - ✗ detection and characterisation of exoplanets (by determining accurate physical parameters through constraining the orbital inclination)
      - ✗ alleviation of the mass-radius problem of the low-mass stars (by significantly increasing the number of low-mass eclipsing binaries with accurate masses, radii and metallicities)
    - ➢ observations
      - ✗ photometry: TIRCAM2@DOT/3.6-m (Devasthal, India), DFOT@ARIES/1.3-m (Nainital, India)
      - ✗ spectroscopy: HERMES@Mercator/1.2-m (La Palma, Spain), HESP@HTC/2-m (Hanle, India)

Science

- **BINA** (Belgo-Indian Network for Astronomy and astrophysics)

  → "Hump-and-spike" stars (observed for normal A and Am/Fm stars)

  - ➢ hump: unresolved Rossby modes (curly bracket)
  - ➢ spike: rotational frequency (dashed line)
    - ✗ theoretical evindence for this interpretation

  > Trust, Jurua, De Cat & Joshi, 2020, MNRAS 492, 3143

  → *Kepler* photometry (170 stars)

  - ➢ determination of
    - ✗ rotational velocity   from frequency spike + radius via Gaia parallaxes
    - ✗ spot radius   from assumption dark spot + amplitude spike
    - ✗ rotational frequency from frequency spike

               from autocorrelation funcion   } undamped
    - ✗ decay-time scale   from autocorrelation function   } simple harmonic oscillator

no significant differences in spot radii (1.01(13) R_E Am/Fm; 1.16(12) R_E normal A)
significant difference in decay-time scale (3.6(2) days Am/Fm; 1.5(2) days normal A)
spots are smaller than GKM-type stars → weak magnetic fields?

Science

- BINA (Belgo-Indian Network for Astronomy and astrophysics)

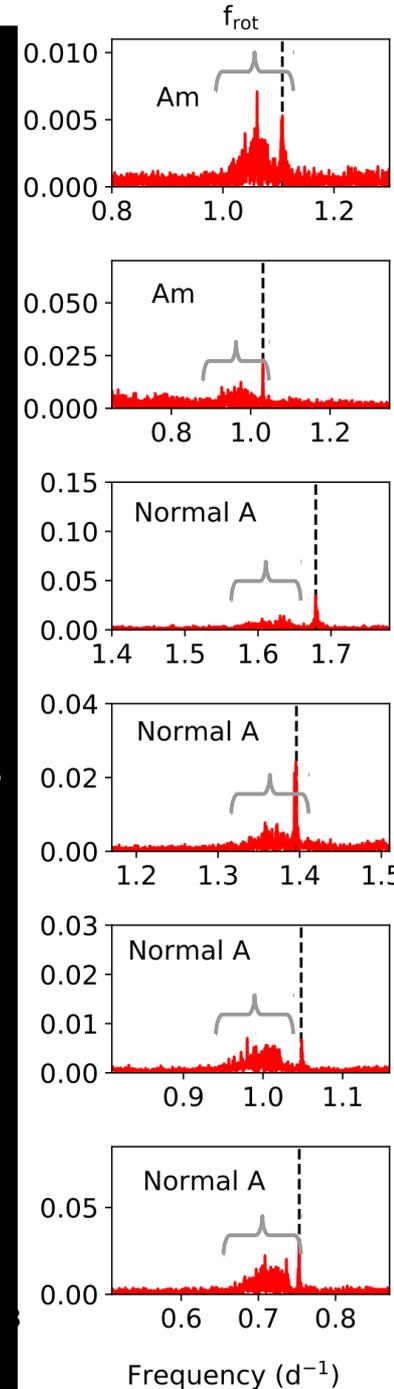 → "Hump-and-spike" stars (observed for normal A and Am stars)

  ➢ hump: unresolved Rossby modes (curly bracket)

  ➢ spike: rotational frequency (dashed line)

  ✗ theoretical evindence for this interpretation

  Trust, Jurua, De Cat et al., 2021, MNRAS 504, 5528

  → HERMES spectroscopy (9 stars)

  ➢ determination of

  ✗ atmospheric parameters from photometric indices
  (*ubvyβ*, 2MASS, Strümgren)

  from spectral energy distributions

  from spectroscopy

  ✗ individual chemical abundances

Trust, 2022, PhD thesis (co-supervisor: De Cat)

2 Am stars: KIC3459226, KIC6266219
1 marginal Am star: KIC 9349245
6 non-Am stars: KIC4567097, KIC4818496, KIC5524045, KIC5650229,
                   KIC7667560, KIC9272082
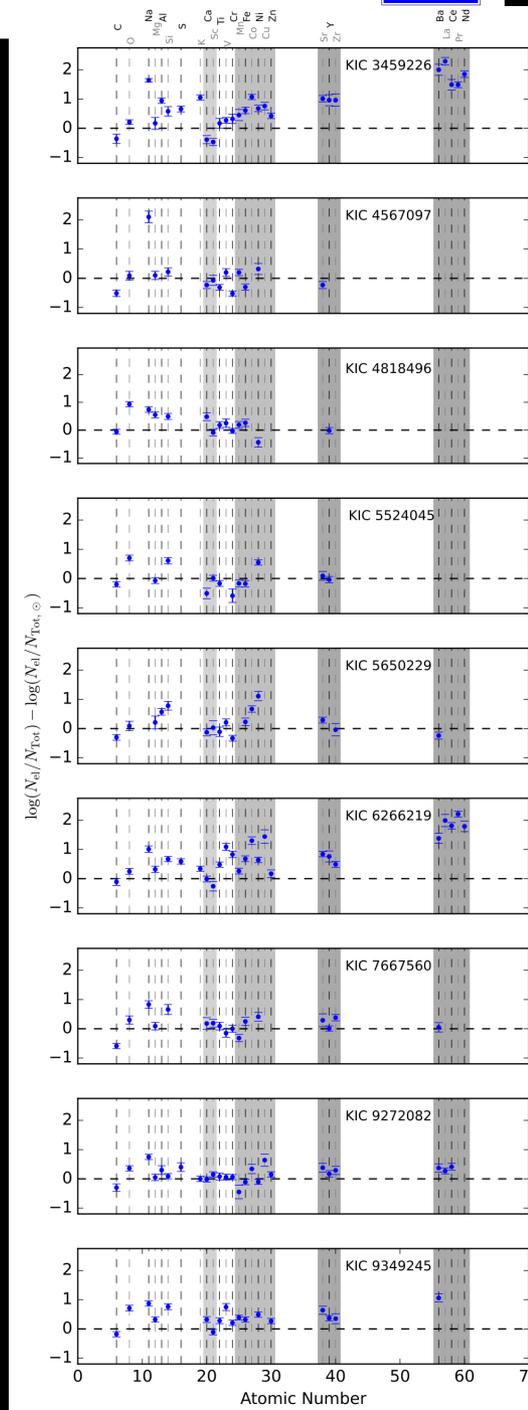
Science

- BINA (Belgo-Indian Network for Astronomy and astrophysics)
  - ➢ Workshops
    - ✗ 1st BINA workshop
      - ✔ *"Instrumentation and Science with the 3.6-m DOT and 4.0-m ILMT telescopes"*
      - ✔ *15/11-18/11/2016 (Nainital, India)*
    - ✗ 2nd BINA workshop
      - ✔ *"BINA as an expanding international collaboration"*
      - ✔ *09/10-12/10/2018 (Brussels, Belgium)*

Royal Observatory of Belgium - Brussels - Belgium

Science

- RUSTICCA (Revalorising the Ukkel Schmidt Telescope by Installing a CCD Camera)

  Collaboration with Thierry Pauwels, Eric Elst and Pierre Vingerhoets (2003-2016)

  ➔ Astrometry of minor planets
    - 5351 published positions of asteroids (observer and reductions)
    - 261 published positions of asteroids (co-observer and/or reductions)
    - 34 published positions of comets (observer and reductions)

  ➔ Photomerty of mutual phenomena of satellites of planets
    - Jupiter: observations of 9 events
    - Saturnus: observations of 1 event
    - Uranus: observations of 1 event

  ➔ Occultations of stars by minor planets
    - observation of 33 events (3 positive)

  ➔ Photometry of mutual phenomena of asteroid and its satellite
    - observation of 1 event

(co-)discoverer of 20 numbered asteroids

Well-being

- Psychosocial risks at work
  - ➔ "The risk that one or more employees suffer psychosocial damage that may or may not be accompanied by physical damage, as a result of exposure to the elements of the job content, terms of employment, job organization, working conditions and professional relationships, on which the employer has an impact and that objectively pose a danger"
    - ➢ stress
    - ➢ burn-out
    - ➢ bore-out
    - ➢ conflicts
    - ➢ violence
    - ➢ bullying
    - ➢ sexual harassment
    - ➢ moral harassment
    - ➢ ...
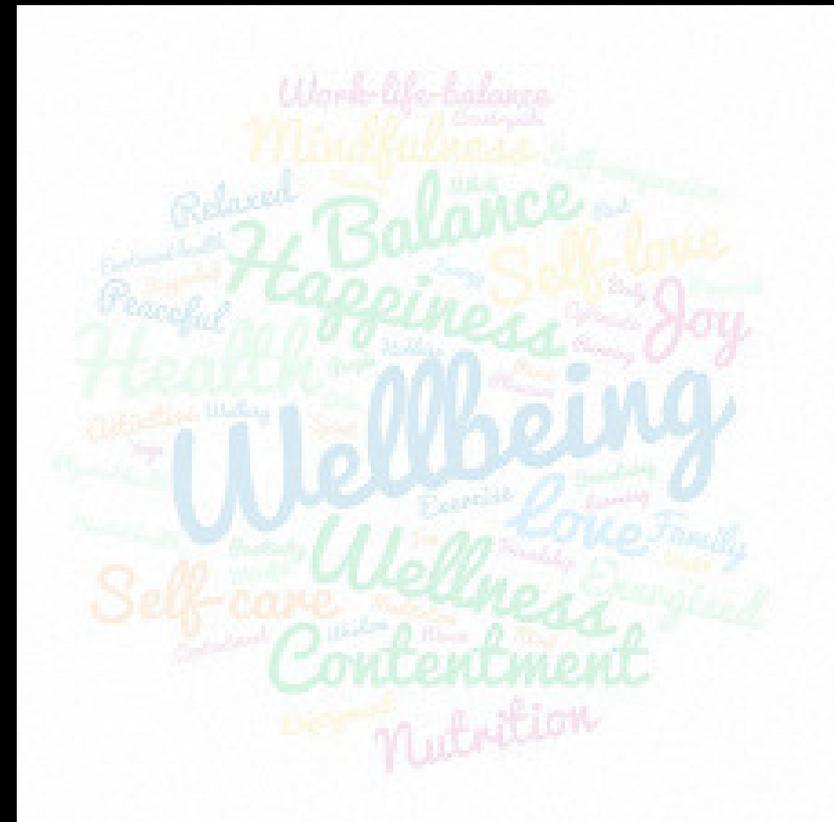
Well-being

- IDEA (InterDepartemental Exchange for Advancement)   since 2014

  ➔ Aim:
  - improve and stimulate the bottom-up communication within the ROB by providing a forum for all ROB employees to:
    - ✗ address problems encountered in their daily work at the ROB,
    - ✗ propose ideas that can potentially improve their daily work at the ROB and/or benefit the ROB in general.

  ➔ Actions:
  - inform the Director's Council of problems and ideas relevant for several ROB departments and ROB in general,
  - keep ROB personnel informed on progress

  ➔ Contact: idea@oma.be

  - ✔ Ann Moyaert (OD1)
  - ✔ Fabienne Collin (OD2)
  - ✔ Marc Hendrickx (OD2)
  - ✔ Peter De Cat (OD3/Conselor in confidence)
  - ✔ Francis Verbeeck (OD4)
  - ✔ Oleg Rezabek (Planetarium)

  - ✔ Timothy Jans (Technical Service)
  - ✔ Hilde Langenaken (Information service/Library/Archives)
  - ✔ Lê Binh San Pham (Information service)

Well-being

- Counselor in confidence since 2018

  ➔ a qualified, independent person with a neutral attitude that you can contact to:

    ➢ discuss about work-related psychosocial problems

    ➢ receive advice

    ➢ help you to find solutions in an informal way, in full confidentiality (professional secret), with the possibility to remain anonymous, with commitment of effort (no commitment of result)

Henri Martin	Peter De Cat	Véronique Delouille	Elke D'Huys
French-speaking	Dutch-speaking	French-speaking	Dutch-speaking
ROB, DO2/ICT	ROB, DO3	ROB, DO4	ROB, DO4
Mire central	Main building	Main building, east wing	Main building
(floor +1, office east)	(floor +1, office 4)	(floor -1/2, office A3)	(floor -1, office A17)
tel: 02/373.0 – 261	tel: 02/373.6 – 785	tel: 02/790.3 – 938	tel: 02/890.9 – 845
Henri.Martin@oma.be	Peter.DeCat@oma.be	Veronique.Delouille@oma.be	Elke.Dhuys@oma.be

Well-being

- Well-beging working group
  - ➔ Aim:
    - ➤ follow-up to the risk analysis of psycho-social aspects (IDEWE November 2018)
  - ➔ Actions:
    - ➤ questionnaire with open questions (WBWG October 2019)
      - ✗ questions are based on points of attention from IDEWE questionnaire
      - ✗ opportunity to staff members to express their feelings and wishes
    - ➤ report of answers to questionnaire (WBWG November 2020)
      - ✗ general overview of answers (happiness + interpersonal relationships + structure, strategy and future + stress + communication + additional suggestions)
      - ✗ suggestion of actions to Director's Council (from answers and discussions)
  - ➔ Contact: wbwg-as@oma.be
    - ✔ Sylvia Consiglio (Planetarium)
    - ✔ Peter De Cat (OD3/Counselor in confidence)
    - ✔ Véronique Delouille (OD4/Counselor in confidence)
    - ✔ Judith de Patoul (OD4)
    - ✔ Elke D'Huys (OD4/Counselor in confidence)
    - ✔ Marc Hendrickx (OD2)
    - ✔ Hilde Langenaken (Information service/Library/Archives)
    - ✔ Henri Martin (ICT/Counselor in confidence)
    - ✔ Marilena Mierla (OD4)
    - ✔ Elisa Pinat (OD1)
    - ✔ Wim Vander Putten (Planetarium)
    - ✔ Sarah Willems (ICT/Union representative)