International Astronomical Union
Commission G1

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## No. 111

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The bibliographical entries for *Individual Stars* and *Collections of Data*, as well as a few *General* entries, are categorized according to the following coding scheme. Data from archives or databases, or previously published, are identified with an asterisk. The observation codes in the first four groups may be followed by one of the following wavelength codes.

g. $\gamma$-ray. i. infrared. m. microwave. o. optical
r. radio u. ultraviolet x. x-ray

**1. Photometric data**

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**2. Spectroscopic data**

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**3. Polarimetry**

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**4. Astrometry**

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**7. Observational techniques**

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**8. Theoretical investigations**

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c. Evolutionary models
d. Loss or exchange of mass and/or angular momentum

**9. Statistical investigations**

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a. Abstract b. Addenda or errata

**Abbreviations**

| | | | | | |
|---|---|---|---|---|---|
| AD | accretion disk | IP | intermediate polar | RV | radial velocity |
| BH | black hole | LC | light curve | SB | spectroscopic binary |
| CB | close binary | LMXB | low-mass x-ray binary | WD | white dwarf |
| CV | cataclysmic variable | NS | neutron star | WR | Wolf-Rayet star |
| EB | eclipsing binary | PSR | pulsar | GW | gravitational wave |
| HMXB | high-mass x-ray binary | QPO | quasi-periodic oscillation | | |

## Individual Stars

| | |
|---|---|
| 47 And<br>(HD 8374) | *Lester, K.V. et al.* (12 authors) 2020, AJ 160, 58. (2ao, 4c, 5de) SB visual orbit with the CHARA array. |
| AE Aqr | *Šimon, V.* 2020, PASJ 72, 35. (1ao, 5ij) Long-term optical activity of the propeller system. |
| EF Aqr | *Stoyanov, K.A. et al.* (9 authors) 2020, MNRAS 495, 1461. (1ux, 2ao, 5bc) Optical spectroscopy and X-ray observations. |
| FO Aqr | *Littlefield, C. et al.* (49 authors) 2020, ApJ 896, 116. (1ox, 2x) The correlation between the IP's low states and the WD's spin-down. |
| V1333 Aql<br>(Aql X-1) | *López-Navas, E. et al.* (5 authors) 2020, MNRAS 493, 940. (1oux, 5i) Emission in the NS LMXB using UV/optical and X-ray observations. |
| V1343 Aql<br>(SS 433) | *Cherepashchuk, A. et al.* (5 authors) 2020, NewAR 89, 101542. (2dx, 4c, 5d) A massive XB in an advanced evolutionary stage.<br>*Picchi, P. et al.* (4 authors) 2020, A&A 640, A96. (2ac, 3ao) Optical spectroscopic and polarimetric study of the microquasar. |
| V1405 Aql<br>(4U 1916−053) | *Trueba, N. et al* (11 authors) 2020, ApJL 899, L16. (1x) Redshifted inner disk atmosphere and transient absorbers in the ultracompact NS XB. |
| V1487 Aql<br>(GRS 1915+105) | *Massaro, E. et al.* (6 authors) 2020, MNRAS 495, 1110. (1x, 8ac) Quiescent, spiking states, and QPOs.<br>*Massaro, E. et al.* (6 authors) 2020, MNRAS 496, 1697. (8ac) Transition and swaying classes.<br>*Massaro, E. et al.* (4 authors) 2020, MNRAS 497, 405. (8ac) A non-linear mathematical model for the X-ray variability. |
| V801 Ara<br>(4U 1636−53) | *Hsieh, H-E., Chou, Y.* 2020, ApJ 900, 116. (1x) Phase-resolved analyses of mHz QPOs.<br>*Lyu, M. et al.* (7 authors) 2020, ApJ 895, 120. (2dx) The rms spectrum of mHz QPOs. |
| V821 Ara<br>(GX 339-4) | *Kosenkov, I.A. et al.* (4 authors) 2020, A&A 638, A127. (1aio, 5i) Colors and patterns of the BH XB.<br>*Kylafis, N.D., Reig, P., Papadakis, I.* 2020, A&A 640, L16. (8a) A quantitative explanation of the type-B QPOs in the HMXB.<br>*Marcel, G. et al.* (9 authors) 2020, A&A 640, A18. (2crx, 8a) A unified accretion-ejection paradigm for BH XBs. V. Low-frequency QPOs.<br>*Tetarenko, B.E. et al.* (5 authors) 2020, MNRAS 495, 3666. (1iox, 5cgi, 7d) A mechanism for X-ray irradiation heating.<br>*Wang, J. et al.* (11 Authors) 2020, ApJ 899, 44. (1x, 2x) Relativistic reflection and reverberation. |
| UY Aur A | *Uvarova, A.V. et al.* (4 authors) 2020, AJ 160, 39. (2c, 5i) Spatially resolved velocity structure in jets of the binary T Tauri system. |
| FS Aur | *Chavez, C.E. et al.* (7 authors) 2020, RMxAA 56, 19. (1do, 5b) Triple CV system hypothesis. |
| KR Aur | *Rodríguez-Gil, P. et al.* (11 authors) 2020, MNRAS 494, 425. (1ao, 2abco, 5bcdeghijk, 6d) Time-resolved optical photometry and spectroscopy of the nova-like variable in the low state. |
| V599 Aur | *Hu, K. et al.* (4 authors) 2020, AJ 160, 62. (1bo, 5bc) Long-term photometry and orbital period change of the W UMa-type binary. |
| DV Boo | *Aliçavuş, F.K., Aliçavuş, F.* 2020, RAA 20, 150. (1ao, 2abc, 5abcdegh) The evolutionary status of the chemically peculiar EB. |

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| CO Cam | Kurtz, D.W. et al. (13 authors) 2020, MNRAS 494, 5118. (1ao, 2ado, 4b, 5bcdeg) The $\delta$ Sct star in this system is a single-sided pulsator. |
| DW Cnc | *Segura Montero, O., Ramírez, S.H., Echeverría, J.* 2020, MNRAS 494, 4110. (1ao, 2ao, 5bdij) Extensive RV monitoring of this IP during the 2018-19 low state. |
| EZ CMa | *Koenigsberger, G., Schmutz, W.* 2020, A&A 639, A18. (2aux, 5d) The nature of the companion in the WR system. |
| XZ CMi | *Wang, Z.-H., Zhu, L.-Y.* 2020, RAA 20, 133. (1ao, 2abc, 5abcdeh) EB is a hierarchical quadruple system. |
| $\eta$ Car | *Akashi, M., Kashi, A.* 2020, MNRAS 494, 3186. (8abd) Hydrodynamic model of the jet-wind interaction in the Great Eruption of the binary.<br>*Grant, D., Blundell, K., Matthews, J.* 2020, MNRAS 494, 17. (2ao, 5de, 8b) Orbital dynamics of stars hidden inside their powerful winds. |
| DQ Car | *Sürgit, D. et al.* (4 authors) 2020, MNRAS 493, 2659. (1ao, 2ao, 5abcdeg) Absolute parameters of the southern EB. |
| V906 Car<br>(ASASSN-18fv)<br>(Nova Car 2018) | *McLoughlin, D., Blundell, K.M., Lee, S.* 2020, MNRAS 494, 743. (2aco, 5ij, 8b) Discovery of circumbinary iron and oxygen in this classical nova.<br>*Wee, J. et al.* (15 authors) 2020, ApJ 899, 162. (1oi) Multiwavelength photometry and progenitor analysis. |
| V635 Cas<br>(4U 0115+634) | *Liu, B.-S. et al.* (11 authors) 2020, ApJ 900, 41. (2dx) A peculiar cyclotron line near 16 keV detected in the HMXB 2015 outburst.<br>*Rouco Escorial, A. et al.* (7 authors) 2020, A&A 638, A152. (2dx, 5i) Recurrent low-level luminosity behaviors after a giant outburst. |
| DY Cen | *Jeffery, C.S., Kameswara Rao, N., Lambert, D.L.* 2020, MNRAS 493, 3565. (2ablo, 5bdghjk) Evolution of the R CrB-type variable, with the SB1 status in doubt. |
| V779 Cen<br>(Cen X-3) | *Chernov, S.V.* 2020, ARep 64, 425 (5e, 8d). HMXB orbital decay. |
| EE Cep | *Pieńkowski, D. et al.* (67 authors) 2020, A&A 639, A23. (1ao, 2co, 5ai) International observational campaign of the 2014 eclipse. |
| TT Cet | *Tian, X.-M., Chang, L.-F.* 2020, PASA 37, 31. (1ao, 2bco, 5abceh) Mass transferring near-contact binary. |
| CN Cha | *Lancaster, L. et al.* (6 authors) 2020, AJ 160, 125. (1o, 2do) Serendipitous discovery of a Galactic symbiotic nova. |
| $\epsilon$ CrA | *Rucinski, S.M.* 2020, AJ 160, 104. (2aco, 5cdeg) Time-sequence spectroscopy. The 518 nm Mg I triplet region analyzed with broadening functions. |
| T CrB | *Evans, A. et al.* (8 authors) 2020, AJ 159, 231. (5gh, 2c) Lithium in the recurrent, symbiotic nova. |
| AF Crv<br>(TYC 5532-1333-1) | *Devarapalli, S.P. et al.* (7 authors) 2020, MNRAS 493, 1565. (1ao, 2a, 5abcej) Contact binary. |
| BP Cru<br>(GX 301-2) | *Mönkkönen, J. et al.* (6 authors) 2020, MNRAS 494, 2178. (1x, 5ij) Discovery of a retrogradely rotating NS in the X-ray PSR of this HMXB. |
| VI Cyg 8A<br>(Cyg OB2 8A) | *Mossoux, E. et al.* (4 authors) 2020, A&A 636, A109. (1ax, 2adox, 5cdj) Non-thermal X-ray emission in the colliding wind binary. |
| CH Cyg | *Cho. S-H. et al.* (6 authors) 2020, ApJL 897, L26. (1o, 2r) Detection of periodicity in SiO maser intensity and velocity shift of the symbiotic star. |

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| V407 Cyg | *Giroletti, M. et al.* (10 authors) 2020, A&A 638, A130. (4cr, 5ij) Advancing ejecta in the first $\gamma$-ray nova. |
| V1357 Cyg (Cyg X-1) | *Lubiński, P. et al.* (4 Authors) 2020, ApJ 896, 101. (1x) Distinct accretion modes in the HMXB. |
| | *Meyer-Hofmeister, E. et al.* (4 authors) 2020, A&A 637, A66. (2dx, 5ij) Wind accretion. |
| | *Yang, C.-Y. et al.* (10 authors) 2020, AJ 160, 54. (3ag, 8a) Feasibility of observing $\gamma$-ray polarization using a CubeSat. |
| | *Zdziarski, A.A., Shapopi, J.N.S., Pooley, G.G.* 2020, ApJL 894, L18. (1rx) Persistent radio jet coupled to hard X-rays in the soft state. |
| V1686 Cyg | *Andreasyan, H., Magakian, T., Movsessian, T.* RAA 20, 53. (1ao, 2bc, 5i) Simultaneous photometric and spectral analysis of a new outburst. |
| NN Del | *Kniazev, A.* 2020, Ap&SS 365, 169. (2ao, 5c) SB2 |
| EX Dra | *Court, J.M.C. et al.* (11 authors) 2020, MNRAS 494, 4656. (1o, 5bi) Using TESS observations and eclipses to separate outside-in and inside-out outbursts. |
| GQ Dra | *Ulas, B. et al.* (8 authors) 2020, AcA 70, 219. (1a, 2a, 5abcde) EB. |
| HZ Her (Her X-1) | *Bala, S. et al.* (4 authors) 2020, MNRAS 497, 1029. (1x, 5cg) Time evolution of cyclotron line. |
| | *Nixon, C.J., Pringle, J.E.* 2020, A&A 636, A34. (5gij, 8bd) Strong surface outflows on ADs. |
| AI Hya | *Lee, J.W., Hong, K., Kristiansen, M.H.* 2020, PASJ 72, 37. (1ao, 5abg) TESS photometry of the eclipsing $\delta$ Scuti star. |
| BK Ind | *Sürgit, D. et al.* (4 authors) 2020, MNRAS 493, 2659. (1ao, 2ao, 5abcdeg) Absolute parameters of the southern EB. |
| CD Ind | *Sobolev,A.V. et al.* (4 authors) 2020, ARep 64, 467. (5i, 8d) Three-dimensional numerical simulation of a flow structure in the asynchronous polar in the approximation of an offset dipole magnetic field of a WD. |
| V344 Lac | *Liu, L. et al.* (7 authors) 2020, Ap&SS 365, 71. (1aio, 5ce) Is ithis contact binary a triple system? |
| $\beta$ LMi | *Wang, X., Xia, F., Fu, Y.* 2020, AJ 160, 141. (2a, 4b, 5de) Improved orbit and component parameters of the SB2. |
| VW LMi | *Pribulla, T. et al.* (11 authors) 2020, MNRAS 494, 178. (1ao, 2ao, 5abcdek, 6d, 8a) Long-term perturbations in the quadruple system with 2+2 hierarchy. |
| IL Lup (4U 1543−47) | *Dong, Y. et al.* (4 authors) 2020, MNRAS 493, 4409. (1x, 2x, 5k) The spin of the BH constrained with the X-ray reflected emission. |
| | *Russell, D.M. et al.* (7 authors) 2020, MNRAS 495, 182. (1ix, 5gi, 8a) A compact jet in the soft-intermediate state. |
| UV Lyn | *Kjurkchieva, D.P. et al.* (4 authors) 2020, AN 341, 453. (1ao, 2ao, 5abcde) W-type W UMa. |
| FL Lyn | *Kjurkchieva, D.P. et al.* (4 authors) 2020, AN 341, 453. (1ao, 2ao, 5abcde) W UMa EB. |
| CY Lyr | *Godon, P. et al.* (4 authors) 2020, MNRAS 494, 5244. (2cdou, 5gij) Balmer lines and jump in absorption in AD modeling of the dwarf nova CV. |
| MV Lyr | *Dobrotka, A., Negoro, H., Konopka, P.* 2020, A&A 641, A55. (1ao) Alternation of the flickering morphology between the high and low state. |
| V677 Lyr (IRAS 19135+3937) | *Bollen, D. et al.* (5 authors) 2020, A&A 641, A175. (2ao, 5i) Determining mass-accretion and jet mass-loss rates in the post-AGB binary system. |

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| V582 Mon | *García Soto, A. et al.* (6 authors) 2020, AJ 159, 135. (1bo, 5i) Evidence for transparency and clumps in the circumbinary ring of the T Tauri system. |
| V694 Mon (MWC 560) | *Zamanov, R.K. et al.* (7 authors) 2020, AN 341, 430. (1ao, 5ij) Flickering of the jet-ejecting symbiotic star. |
| V838 Mon | *Goranskij, V.P. et al.* (8 authors) 2020, AstBu 75, 325. (1ac, 2a, 5, 8). Progenitor and remnant of the Luminous Red Nova. |
| QX Nor (4U 1608−52) | *van den Eijnden, J. et al.* (10 authors) 2020, MNRAS 493, 1318. (1x, 2x, 5hi) Strongly changing accretion morphology during the outburst decay of the NS in the LMXB. |
| V2293 Oph (GRS 1716−249) | *Bassi, T. et al.* (12 authors) 2020, MNRAS 494, 571. (1aigorux, 2dgx, 5ij) The nature of the soft $\gamma$-ray emission in the hard state of the BH transient during the 2016-17 outburst. |
| $\iota$ Ori | *Heyne, T. et al.* (7 authors)2020, AN 341, 645. (2ao, 5d) The runaway star is an SB2. |
| GW Ori | *Kraus, S. et al.* (32 authors) 2020, Sci 369, 1233. (3aio, 4cir, 5i) A triple-star system with a misaligned and warped circumstellar disk shaped by disk tearing. |
| V1055 Ori (4U 0614+091) | *Shi, C.-S., Zhang, S.-N.* 2020, MNRAS 494, 4382. (5ej, 8ad) Estimating the NS mass by twin kHz QPOs and innermost stable circular orbits to constrain equations of state using MHD models. |
| V1878 Ori | *Lavail, A. et al.* (6 authors) 2020, MNRAS 497, 632. (1x, 3b, 5ceg, 8a) Brightness maps and global magnetic field topologies. |
| 43 Per (HD 24546) | *Lester, K.V. et al.* (12 authors) 2020, AJ 160, 58. (2ao, 4c, 5de) SB visual orbit with the CHARA array. |
| Z Per | *Khaliullina, A.I.* 2020, ARep 64, 619. (5b) Multiperiodicity in the EB orbital period variations. |
| KR Per | *Sowell, J. R. et al.* (8 authors) 2020, AJ 160, 13. (1bo, 2ao, 5cde) One-day orbital period EB. |
| V680 Per | *Wang, J.-J., He, J.-J., Zhao, S.-Q.* 2020, RAA 20, 50. (1ao, 5abcj) New multi-color photometric investigations of solar-like contact binary. |
| SZ Psc | *Cao, D. et al.* 2020, AJ 159, 292. (2co, 5g) Chromospheric and prominence activity of the RS CVn system. |
| V441 Pup (3A 0726−260) | *Roy, J. et al.* (4 authors) 2020, RAA 20, 155. (1bx, 2dx) AstroSat observation of the Be/X-ray binary PSR. |
| HM Sge | *Sanad, M.R., Abdel-Sabour, M.A.* 2020, RMxAA 56, 63. (2cu, 5g) UV spectral behavior of the symbiotic nova. |
| V426 Sge | *Skopal, A. et al.* (19 authors) 2020, A&A 636, A77. (1ao, 2dux, 5gj) Z And-type outburst and a possible classical symbiotic CV. |
| 9 Sgr | *Quintero, E.A., Eenens, P., Rauw, G.* 2020, AN 341, 628. (2ao, 7d) New insights into disentangling methods applied to the massive SB2. |
| V3890 Sgr | *Orio, M. et al.* (16 authors) 2020, ApJ 895, 80. (2cdx, 5j) Observed shortly after onset of outburst. |
| V4396 Sgr | *Sürgit, D. et al.* (4 authors) 2020, MNRAS 493, 2659. (1ao, 2ao, 5abcdeg) Absolute parameters of the southern EB. |
| V4580 Sgr (SAX J1808.4−3658) | *Bult, P. et al.* (8 authors) 2020, ApJ 898, 37. (1x, 2x) Timing the pulsations of the accreting millisecond PSR during its 2019 outburst.<br>*Goodwin, A.J., Woods, T.E.* 2020, MNRAS 495, 796. (1x, 8acd) A study of the binary evolution. |

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| $\mu^1$ Sco<br>(HD 151890) | *Cotton, D.V. et al.* (4 authors) 2020, MNRAS 497, 2175. (3ab, 5ceg) Phase-locked polarization by photospheric reflection. |
| $\xi$ Sco | *Tokovinin, A.* 2020, AJ 159, 265. (1ao, 4b, 5e) Quintuple hierarchical system. |
| AR Sco | *Šimon, V.* 2020, PASJ 72, 35. (1ao, 5ij) Long-term optical activity of the propeller system. |
| V884 Sco<br>(4U 1700 − 37) | *Bala, S., Roy, J., Bhattacharya, D.* 2020, MNRAS 493, 3045. (1x, 2x, 5i) Possible detection of a new cyclotron feature in the HMXB. |
| V926 Sco<br>(4U 1735−44) | *Ludlam, R.M. et al.* (11 authors) 2020, ApJ 894, 45. (2cdx) Reflection model applied to the AD. |
| V1309 Sco | *MacCleod, M., Loeb, A.* 2020, ApJ 893, 106. (8bcd) Runaway coalescence of pre-common-envelope stellar binaries. |
| V479 Sct<br>(LS 5039) | *Molina, E., Bosch-Ramon, V.* 2020, A&A 641, A84. (8b) A dynamical and radiation semi-analytical model of PSR-star colliding winds along the orbit. |
| UZ Ser | *Godon, P. et al.* (4 authors) 2020, MNRAS 494, 5244. (2cdou, 5gij Balmer lines and jump in absorption in AD modeling of the dwarf nova CV. |
| MM Ser<br>(Ser X-1) | *Mondal, A.S., Dewangan, G.C., Raychaudhuri, B.* 2020, MNRAS 494, 3177. (1x, 2x, 5i) X-ray observations of the NS in the LMXB. |
| T Tau | *Schaefer, G.H. et al.* (4 authors) 2020, AJ 160, 35. (1b, 4ci, 5e) Orbital motion, variability, and masses of the triple system. |
| UX Tau | *Ménard, F. et al.* (31 authors) 2020, A&A 639, L1. (3a1, 8d) Ongoing flyby in the young multiple system. |
| DF Tau | *Uvarova, A.V. et al.* (4 authors) 2020, AJ 160, 39. (2c, 5i) Spatially resolved velocity structure in jets of the binary T Tauri system. |
| V1241 Tau | *Ulas, B. et al.* (8 authors) 2020, AcA 70, 219. (1a, 2a, 5abcde) EB. |
| V1419 Tau<br>(1SWASP J034439.97+030425.5) | *Zhang, B. et al.* (8 authors) 2020, RAA 20, 47. (1ao, 5abcej) A short-period EB with a close-in stellar companion. |
| QV Tel<br>(HR 6819) | *Bodensteiner, J. et al.* (13 authors) 2020, A&A 641, A43. (2abo, 5d) A triple system containing a BH? An alternative explanation.<br>*Rivinius, Th. et al.* (5 authors) 2020, A&A 637, L3. (2ao, 5de) A naked-eye triple system with a nonaccreting BH in the inner binary.<br>*Safarzadeh. M., Toonen, S., Loeb, A.* 2020, ApJ 899, L29. (8a, 9) The BH is likely not in a triple configuration. |
| KZ TrA<br>(4U 1626−67) | *Benli, O.* 2020, MNRAS 495, 3531. (1x, 5cgi, 8a) X-ray luminosity and rotational properties. |
| RW Tri | *Subebekova, G. et al.* (8 authors) 2020, MNRAS 497, 1475. (1ao, 2bc, 5cegi) Accretion flow structure. |
| $\kappa$ Tuc | *Tokovinin, A.* 2020, AJ 159, 265. (1ao, 4b, 5e) Quintuple hierarchical system. |
| PS UMa | *Volkov, I.M., Kravtsova, A.S.* 2020, ARep 64, 211. (1ab, 5bcef). EB evolutionary status and physical parameters. |
| W UMi | *Soydugan, F., Soydugan, E., Aliçavuş, F.* 2020, RAA 20, 52. (1ao, 2ao, 5abcdej) Observations and evolutionary models of the near-contact semi-detached binary. |
| GP Vel<br>(Vel X-1) | *Lomaeva, M. et al.* (11 authors) 2020, A&A 641, A144. (2cx) High-resolution X-ray spectroscopy of the stellar wind during a flare. |

KQ Vel — *Oskinova, L.M. et al.* (4 authors) 2020, A&A 641, L8. (2bx) Chandra confirmation of the magnetic standard Ap star hosting an NS companion.

KV Vel — *Ríos-Venegas, C. et al.* (11 authors) 2020, MNRAS 493, 1197. (1a, 5ab) Post-common envelope binary.

UY Vol (EXO 0748−676) — *Parikh, A.S. et al.* (7 authors) 2020, A&A 638, L2. (2dx) Unexpected late-time temperature increase in the NS crust-cooling LMXB.

7 Vul — *Harmanec, P. et al.* (8 authors) 2020, A&A 639, A32. (2ac) SB with a Be star primary.

CK Vul — *Eyres, S.P.S. et al.* (10 authors) 2020, MNRAS 493, 1328. (10b) Erratum. ALMA reveals a WD-brown dwarf merger.

## HR, HD, HDE, BD, CoD, CPD, SAO Objects

HD 8374 — (see 47 And)

HD 24546 — (see 43 Per)

HD 34865 (GJ 3346) — *Bonavita, M. et al.* (10 authors) 2020, MNRAS 494, 3481. (1i, 2acd, 4ab, 5eghk, 6bd) A new WD companion of the nearby K star.

HD 54662 AB — *Barbá, R.H. et al.* (12 authors) 2020, MNRAS 494, 3937. (2abco, 5bdeghk) A new quantitative spectroscopic analysis of this massive O+O system, including spectral disentagling, and a new orbital solution.

HD 93129 A — *del Palacio, S. et al.* (15 authors) 2020, MNRAS 494, 6043. (1gx, 2x, 5j) High-energy emission near the periastron passage in this massive colliding wind system.

HD 136511 (WDS J15187+5334) — *Luna, A., Orlov, V.G.* 2020, AJ 160, 9. (4bcao, 6b) Speckle holography of visual double stars at the 2.1 m telescope of the Observatorio Astronómico Nacional at Sierra de San Pedro Mártir. SB with a possible close companion to the primary.

HD 151890 — (see $\mu^1$ Sco)

HD 161853 — *Herrero, A. et al.* (6 authors) 2020, MNRAS 494, 2117. (2aco, 5ghk) Spectroscopic analysis indicates that this massive O-type SB2 is not post-AGB.

HD 181850 (KIC 3230227) — *Guo, Z.* 2020 ApJ 896, 161. Tidal asteroseismology: possible evidence of nonlinear mode coupling in an equilibrium state of the EB.

HD 188538 (KIC 8975515) — *Samadi-Ghadim, A. et al.* (4 authors) 2020, A&A 638, A57. (1ao, 5c) SB2 with a fast-rotating $\gamma$ Dor - $\delta$ Sct hybrid star and a slower $\delta$ Sct companion.

HD 269919 (RMC 140) — *Grant, D., Blundell, K., Matthews, J.* 2020, MNRAS 494, 17. (2ao, 5de, 8b) Orbital dynamics of stars hidden inside their powerful winds.

HD 306414 (IGR J11215−5952) — *Sidoli, L. et al.* (7 authors) 2020, A&A 638, A71. (2dx, 5i) The supergiant fast X-ray transient during the 2017 outburst.

HR 6819 — (see QV Tel)

BD+46°442 — *Bollen, D. et al.* (5 authors) 2020, A&A 641, A175. (2ao, 5i) Determining mass-accretion and jet mass-loss rates in the post-AGB binary system.

CPD−63°2495 — *Chernyakova, M. et al.* (7 authors) 2020, MNRAS 497, 648. (1agox, 5cg, 8a) New insight into the origin of the GeV flare.

## Objects with names including RA and DEC

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| 3XMM J000511.8+634018 | *Schwappe, A.D. et al.* (5 authors) 2020, A&A 637, A35.(1ao, 2diox, 5i) New polar with a 133.5 min orbital period. |
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| CXOU J012745.9−733256 (SXP 1062) | *Cappallo, R.C. et al.* (7 authors) 2020, MNRAS 495, 2152. (1x, 5cg, 8a) Geometry of the X ray emission.<br>*Tsygankov, S. et al.* (9 authors) 2020, A&A 637, A33. (2dx, 5i) The unusual behavior of the young X-ray PSR during the 2019 outburst. |
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| 4U 0614+091 | (See V1055 Ori) |
| ASASSN-V J071855.62−434247.3 | *Jayasinghe, T. et al.* (13 authors) 2020, MNRAS 493, 4186. (1ao, 5b, 6ab) New EB among the $\delta$ Sct binaries in a sample of ≈8400 $\delta$ Scuti variables in ASAS-SN, discovered with TESS. |
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| 4U 1323−62 | *Bhulla, Y., Roy, J., Jaaffrey, S.N.A.* 2020, RAA 20, 98. (2dx, 5gi) Detection of thermonuclear X-ray bursts and dips from the LMXB with AstroSat/LAXPC. |
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| 4U 1543−473 | (see IL Lup) |
| XTE J1550−564 | *Connors, R.M.T. et al.* (10 authors) 2020, ApJ 892, 47. (2dx, 5i) Evidence of returning disk radiation during outburst. |
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| IRAS 16293−2422A | *Maureira, M.J. et al.* (8 authors) 2020, ApJ 897, 59. (1r) Orbital and mass constraints of the young binary system. |
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| 4U 1700 − 37 | (See V884 Sco) |
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| GRS 1716−249 | (See V2293 Oph) |
| 2MASS J17195764+5750054 (Draco C1) | *Lewis, H.M. et al.* (17 authors) 2020, ApJL 900, L43. (2ai, 5d) Geometry of the symbiotic binary. |
| 4U 1735−44 | (see V926 Sco) |
| 1E 1740.7−2942 | *Stecchini, P.E. et al.* (5 authors) 2020, MNRAS 493, 2694. (1x, 2dx, 5ehij) Broadband X-ray analysis of this HMXB candidate in the Galactic Centre region constraining the spin and inclination. |
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| Swift J1858.6−0814 | *Muñoz-Darias, T. et al.* (18 authors) 2020, ApJL 893, L19. (2cdo, 5j) Observations of winds, flares and radio jets.<br>*van den Eijnden, J. et al.* (21 authors) 2020, MNRAS 496, 4127. (1r, 5cgi) Detection of a radio counterpart. |
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| PSR J1913+1102 | *Ferdman, R.D. et al.* (14 authors) 2020, Nature 583, 211. (4cr, 9) Asymmetric mass ratios for bright double NS mergers. |
| GRS 1915+105 | (see V1487 Aql) |
| 4U 1916−053 | (see V1405 Aql) |
| KS 1947+300 | *Doroshenko, R. et al.* (4 authors) 2020, MNRAS 493, 3442. (1x, 2dx, 5hi) HMXB X-ray study. |
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| ZTF J205515.98+465106.5 | *Kupfer, T. et al* (33 authors) 2020, ApJL 898, L25. (1o, 2o, 5c) A Roche lobe-filling hot subdwarf transferring mass to a WD companion. |
| GRO J2058+42 | *Kabiraj, S., Paul, B.* 2020, MNRAS 497, 1059. (1x, 2d) HMXB broadband X-ray characteristics.<br>*Mukerjee, K., Antia, H.M., Katoch, T.* 2020, ApJ 897, 73. (1x, 2x) AstroSat observations during the 2019 outburst. |

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| TCP J21040470+4631129 | *Tampo, Y. et al.* (54 authors) 2020, PASJ 72, 49. (1ao, 2co, 5bcij, 6b) First detection of two superoutbursts during the rebrightening phase of the WZ Sge-type dwarf nova. |
| EC 21178−5417 | *Khangale, Z.N. et al.* (6 authors) 2020, MNRAS 495, 637. (2bc 5dgij) Discovery of spiral density structures. |
| 1SWASP J212454.61+203030.8 | *Martignoni, M. et al.* (4 authors) 2020, RMxAA 56, 225. (1ao, 5abc) First photometric investigation of the EB. |
| CRTS J213033.6+213159 | *Martignoni, M. et al.* (4 authors) 2020, RMxAA 56, 225. (1ao, 5abc) First photometric investigation of the EB. |
| NGTS J214358.5−380102 | *Acton, J.S. et al.* (26 authors) 2020, MNRAS 494, 3950. (1ao, 2abdio, 5bcdek) Discovery of the most eccentric known M-dwarf EB. |
| PTF1 J2224+17 | *Schwope, A.D., Thinius, B.D.* 2020, AN 341, 424. (1ao, 2co*, 5bi) Short-period, high-field polar. |
| 4FGL J2333.1−5527 | *Swihart, S.J. et al.* (10 authors) 2020, ApJ 892, 21. (1ao, 2dox, 6b) Likely redback millisecond binary PSR with massive NS. |
| PSR J2339−0533 | *An, H., Romani, R.W., Kerr, M.* 2020, ApJ 897, 52. (1x) Orbital modulation of $\gamma$ rays. |

## X-ray sources with constellation or galaxy names

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| Aql X-1 | (see V1333 Aql) |
| Cen X-3 | (see V779 Cen) |
| Cir X-1 | (see BR Cir) |
| Cyg X-1 | (see V1357 Cyg) |
| Her X-1 | (see HZ Her) |
| LMC P3 | (see HESS J0536−675) |
| LMC X-1 | *Tripathi, A. et al.* (9 authors) 2020, ApJ 897, 84. (1x*) Testing General Relativity with the stellar-mass BH using the continuum-fitting method. |
| LMC X-4 | (see 1RXS J053246.1−662203) |
| M51 ULX-7 | *Rodríguez Castillo, G.A. et al.* (29 authors) 2020, ApJ 895, 60. (2dx, 5e) Discovery of a 2.8-s PSR in a 2-day orbit HMXB powering the ULX. |
| NGC 1313 X-1 | (see RX J0320.3−6629) |
| Ser X-1 | (see MM Ser) |
| Vel X-1 | (see GP Vel) |

## Objects with other designations

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| ASASSN-18fv | (see V906 Car) |
| Apep | *Callingham, J.R. et al.* (7 authors) 2020, MNRAS 495, 3323. (2bio, 5degj) Composed of two classical WR stars. |
| CVSO 30 | *Koen, C.* 2020, MNRAS 494, 4349. (1ao, 5b) TESS measurements suggest that the star is probably a binary T Tauri star with complex light curves and no obvious planets. |
| Draco C1 | (see 2MASS J17195764+5750054) |
| EPIC 219552514 | *Torres, L. et al.* (6 authors) 2020, ApJ 896, 162. (1a, 2a, 5cde) Double-lined triple star system in the open cluster Ruprecht 147. |

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| FRB 121102 | *Lyutikov, M., Barkov, M., Giannios, D.* 2020, ApJL 893, L39. (1r,5j) Fast radio burst identified as a tight O/B-NS binary. |
| FRB 171019 | *Jian, J.-C. et al.* 2020, RAA 20, 56. (8c) A binary NS merger? |
| GJ 3346 | (see HD 34865) |
| GPX TF16E-48 | *Krushinsky, V. et al.* (17 authors) 2020, MNRAS, 493, 5208. (1ao, 2abdo, 5bcdeg, 6bd) Pre-CV with unusual chromaticity of the eclipsed WD. |
| GW170502 | *Udall, R. et al.* (8 authors) 2020, ApJ 900, 80. (8) Inferring parameters of the intermediate-mass BH trigger. |
| GW170817 (AT 2017gfo) | *Ciolfi, R., Kalinani, J.V.* 2020, ApJL 900, L35. (8) Magnetically driven baryon winds from binary NS merger remnants and the blue kilonova of 2017 August.<br>*Lazzati, D., Ciolfi, R., Perna,R.* 2020, ApJ 898, 59. (8abd) Intrinsic properties of the engine and jet that powered the short $\gamma$-ray burst associated with the GW.<br>*Reyes, S., Brown, D.A.* 2020, ApJ 894, 41. (8cd) Constraints on nonlinear tides due to p-g mode coupling.<br>*Yao, L. et al.* (6 authors) 2020, ApJ 900, 31. (8) Testing the weak equivalence principle with the binary NS merger: The gravitational contribution of the host galaxy. |
| GW190412 | *Hamers, A.S., Safarzadeh, M.* 2020, ApJ 898, 99. (8) A 3 + 1 quadruple configuration?<br>*Safarzadeh, M., Hotokezaka, K.* 2020, ApJL 897, L7. (8) Field formation interpretation?<br>*Zevin, M. et al.* (5 authors) 2020, ApJL 899, L17. (8) The impact of prior assumptions on the interpretation of the unequal-mass BH binary. |
| GW190425 | *Kruckow, M.U.* 2020, A&A 639, A123. (8a) Masses of double NS mergers.<br>*Safarzadeh, M., Ramirez-Ruiz, E., Berger, E.* 2020, ApJ 900 13. (8) An alternative to a fast-merging channel formation pathway may be required. |
| GW190521 | *Abbott, R. et al.* (1255 authors) 2020, ApJL 900, L13. Properties and astrophysical implications of the 150 $M_\odot$ binary BH merger. |
| GW190814 | *Abbott, R. et al.* (1257 authors) 2020, ApJL 896, L44. Gravitational waves from the coalescence of a 23 $M_\odot$ BH with a 2.6 $M_\odot$ compact object. |
| GX 301-2 | (see BP Cru) |
| GX 339-4 | (see V821 Ara) |
| HZ 9 | *Ríos-Venegas, C. et al.* (11 authors) 2020, MNRAS 493, 1197. (1a, 5ab) Post-common envelope binary. |
| Hen 2-428 | *Reindl, N. et al.* (8 authors) 2020, A&A 638, A93. (1ai, 2aco, 5cdeg) SB2 and alleged type Ia SN progenitor. |
| HIP 14864 | (see WDS J03119+6131) |
| HIP 41322 | (see WDS J08259−1623) |
| KIC 3230227 | (see HD 181850) |
| KIC 8043961 | *Kamil, C. et al.* (4 authors) 2020, RMxAA 56, 179. (1ao, 2ao, 5cde) Triple system with a $\gamma$ Dor pulsating primary component. |
| KIC 8975515 | (see HD 188538) |
| KIC 12268220 | *Cui, K. et al.* (7 authors) 2020, ApJ 898, 136. (1o, 2o, 5cde) $\delta$ Sct + active proto-helium WD EB. |
| KIC 8975515 | (see HD 188538) |

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| Kepler-5b | *Abubekerov, M.K., Gostev, N.Yu.* 2020, ARep 64, 556. (5c) Exoplanet transients: Possible variations in the limb-darkening coefficients of eclipsed stars at short time intervals. |
| Kepler-6b | *Abubekerov, M.K., Gostev, N.Yu.* 2020, ARep 64, 556. (5c) Exoplanet transients: Possible variations in the limb-darkening coefficients of eclipsed stars at short time intervals. |
| Kepler-7b | *Abubekerov, M.K., Gostev, N.Yu.* 2020, ARep 64, 556. (5c) Exoplanet transients: Possible variations in the limb-darkening coefficients of eclipsed stars at short time intervals. |
| LB 1 | *Eldridge, J.J. et al.* (6 authors) 2020, MNRAS 495, 2786. (8ac) The system does not contain a 70 $M_\odot$ BH. |
| LINEAR 1286561 | *Acerbi, F. et al.* (5 authors) 2020, RAA 20, 62. (1ao, 5abd) Ultra-short period detached EB. |
| LINEAR 2602707 | *Acerbi, F. et al.* (5 authors) 2020, RAA 20, 62. (1ao, 5abd) Ultra-short period detached EB. |
| LS 5039 | (see V479 Sct) |
| MACHO 311.37557.169 | *Wörpel, H. et al.* (4 authors) 2020, AN 341, 283. (1aox, 2dox) Likely a VY Scl-type CV. |
| MWC 560 | (see V694 Mon) |
| [NBN2015] 78 | (see 2MASS J06073800+2407249) |
| Nova Car 2018 | (see V906 Car) |
| NSVS 781878 | *Kjurkchieva, D.P. et al.* (4 authors) 2020, AN 341, 453. (1ao, 2ao, 5abcde) A-type W UMa. |
| OGLE BLG-ECL-157529 | *Mennickent, R.E. et al.* (7 authors) 2020, A&A 641, A91. (1ao, 5i) Long photometric cycle and disk evolution in the $\beta$ Lyrae-type EB. |
| PN A66 65 | *Ríos-Venegas, C. et al.* (11 authors) 2020, MNRAS 493, 1197. (1a, 5ab) Post-common envelope binary. |
| PTFO 8-8695 | *Bouma, L.G. et al.* (16 authors) 2020, AJ 160, 86. (1a, 5b) Likely a pair of young, rapidly rotating M dwarfs. |
| qLMXB in GCM30 | *Echiburú, C.S. et al.* (6 authors) 2020, MNRAS 495, 4508. (1x, 5ceg, 8a) Spectral analysis. |
| RMC 140 | (see HD 269919) |
| SS 433 | (see V1343 Aql) |
| SXP 1062 | (see CXOU J012745.9−733256) |
| TIC 167692429 | *Borkovits, T. et al.* (8 authors) 2020, MNRAS 493, 5005. (1o, 2d, 5abce, 6b, 8ad) Hiearchical triple system discovered with TESS. |
| TIC 209409435 | *Borkovits, T. et al.* (12 authors) 2020, MNRAS 496, 4624. (1ao, 5abceg) A compact triply eclipsing triple star. |
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GQ Mus, BT Mon, V972 Oph, V2104 Oph, V2214 Oph, V4157 Sgr, V4160 Sgr, V4169 Sgr, V4171 Sgr, V4361 Sgr, V4444 Sgr, V4633 Sgr, V4642 Sgr, V960 Sco, V977 Sco, V1141 Sco, V1142 Sco, FV Sct, V373 Sct, V443 Sct, V444 Sct, FH Ser, LW Ser, LV Vul, CRTS J054558.3+022106, IGR J17014−4306, IPHASX J210204.7+471015.

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