

**INTERNATIONAL ASTRONOMICAL UNION**  
**COMMISSION G1 (BINARY AND MULTIPLE STAR SYSTEMS)**  
**DOUBLE STARS INFORMATION CIRCULAR No. 188 (FEBRUARY 2016)**

**NEW ORBITS**

<b>ADS</b> $\alpha$ 2000 $\delta$	<b>Name</b> <b>n</b>	<b>P</b> <b>a</b>	<b>T</b> <b>i</b>	<b>e</b> $\omega$	$\Omega$ (2000) <b>Last ob.</b>	<b>2016</b> <b>2017</b>	<b>Author(s)</b>
- 01477-4358	I 52 1°6079	223 <sup>y</sup> 9 0''372	1969.74 150°4	0.847 12°5	20°9 2015.9131	207°3 0''516 206.9 0.522	DOCOBO et al. (*)
1833 02257+6133	STF 257 0.6461	557. 0.621	1934.00 43.8	0.588 165.8	142.4 2007.6021	78.0 0.453 78.8 0.458	DOCOBO & LING
2177 02512+0141	A 2338 2.0000	180.00 0.308	2005.98 38.3	0.736 119.3	157.3 2015.9103	15.2 0.158 19.1 0.165	DOCOBO et al. (*)
2464 03189-0101	BU 1177 1.3931	258.4 0.494	1903.10 120.2	0.268 16.3	16.2 2015.7435	194.9 0.619 194.5 0.620	DOCOBO et al. (*)
- 04142-4608	RST 2338 9.9092	36.33 0.296	1993.01 55.6	0.011 166.0	136.9 2015.9132	157.0 0.267 164.4 0.247	DOCOBO et al. (*)
- 05140+5126	HU 821 2.5536	140.98 0.653	1971.26 40.5	0.616 312.9	53.9 2012.7706	171.5 0.759 172.6 0.768	DOCOBO &CAMPO
5092 06274-2544	B 114 6.0291	59.71 0.428	2037.10 21.2	0.538 358.5	179.5 2015.9132	16.5 0.613 18.9 0.601	DOCOBO et al. (*)
- 06541+6052	HEI 334 47.4121	7.593 0.323	2005.837 120.5	0.729 68.4	134.5 2007.8181	279.2 0.369 265.8 0.344	DOCOBO & CAMPO (I)
- 06541+6052	HEI 334 32.3653	11.123 0.426	2008.569 111.6	0.421 69.1	113.3 2007.8181	182.7 0.216 148.7 0.275	DOCOBO & CAMPO (II)
7551 09524+2659	STF 1389 0.2476	1454. 2.773	2420.07 122.7	0.307 265.1	80.9 2013.314	290.1 2.506 289.9 2.508	LING
- 18434-5546	B 398 7.6531	47.04 0.279	2013.95 105.2	0.124 133.2	166.8 2015.7375	354.3 0.222 351.4 0.238	DOCOBO et al. (*)

**NEW ORBITS (continuation)**

<b>ADS</b> $\alpha$ <b>2000</b> $\delta$	<b>Name</b> <b>n</b>	<b>P</b> <b>a</b>	<b>T</b> <b>i</b>	<b>e</b> $\omega$	$\Omega$ ( <b>2000</b> ) <b>Last ob.</b>	<b>2016</b> <b>2017</b>	<b>Author(s)</b>
- 21000+4004	KUI 103AB 12.4568	28.90 0.709	2007.26 36.3	0.656 116.0	143.5 2012.90	59.3 0.839 64.5 0.879	DOCOBO & LING
16111 22361+7253	BU 1092AB 7.3571	48.93 0.215	1994.48 66.4	0.742 349.3	45.5 2008.6560	211.4 0.277 212.7 0.292	DOCOBO & CAMPO
- 22570+2441	COU 542Aa,Ab 11.6317	30.95 0.182	1987.56 21.7	0.391 174.9	19.8 2008.689	131.9 0.124 155.3 0.115	DOCOBO & LING

(\*) DOCOBO, GOMEZ & CAMPO

**NEW DOUBLE STARS**

Discovered by: A. Debackère with the LCOGT network telescopes:  
T2m Faulkes Telescope North, Hawaii and T1m Mac Donald, Texas

<b>STAR</b>	<b>UCAC4</b> <b>USNO-B1.0</b>	<b>Mag.</b>	<b>Coord. 2000</b>	<b>Epoch</b>	$\theta$ ( $^{\circ}$ )	$\rho$ ( $''$ )	<b>nights</b>
DBR 1 BC	707-109961	10.9 16.4	23:03:08.93+51:20:23.5	2015.786	8.9	3.06	4
DBR 4	573-029417	12.6 13.4	06:27:08.52+24:28:39.0	2015.13	74.1	4.03	1
POU 1332*	573-029420	12.1 12.6	06:27:09.49+24:28:26.5	2015.14	323.6	15.54	2
DBR 5	558-048557	12.0 12.5	09:31:55.09+21:24:57.2	2015.21	283.9	2.71	2
DBR 13 BC	707-109870	14.3 17.5	23:02:39.65+51:21:17.3	2015.875	276.2	1.64	1
DBR 15	584-028228	13.8 15.2	06:21:43.04+26:44:54.0	2015.93	309.0	2.21	3
DBR 16	584-028468	13.0 15.4	06:22:38.73+26:46:42.1	2015.93	303.1	3.03	3
DBR 17	583-028424	13.1 13.7	06:23:02.29+26:29:20.1	2015.93	128.3	2.99	3
DBR 18	584-028158	13.9 16.4	06:21:24.08+26:46:20.2	2015.93	28.6	4.55	3
DBR 19	585-028193	12.5 15.3	06:21:45.48+26:48:37.9	2015.93	314.4	4.17	3
DBR 20	584-028267	14.3 17.9	06:21:53.83+26:42:34.0	2015.93	129.8	3.68	3
DBR 21	584-028292	14.1 17.9	06:21:59.04+26:45:38.1	2015.93	22.6	2.85	3

\* The second component of POU 1332 has a companion called C in DBR 4 BC

## NEW DOUBLE STARS

Discovered by: A. Debackère with the LCOGT network telescopes:  
T2m Faulkes Telescope North, Hawaii and T1m Mac Donald, Texas  
(continuation)

STAR	UCAC4 <u>USNO-B1.0</u>	Mag.	Coord. 2000	Epoch	$\theta$ ( $^{\circ}$ )	$\rho$ ( $''$ )	nights
DBR 22	584-028320	14.4 16.4	06:22:04.60+26:44:58.2	2015.93	109.4	4.27	2
DBR 23	584-028528	14.2 17.6	06:22:54.39+26:46:53.6	2015.92	176.7	3.58	1
DBR 24	583-028399	15.2 19.3	06:22:56.46+26:29:29.3	2015.93	226.2	3.29	2
DBR 25	<u>1165-0112266</u>	17.2 18.3	06:23:01.44+26:31:43.5	2015.93	113.1	2.97	2
DBR 26	583-028466	14.0 15.4	06:23:11.33+26:35:40.1	2015.93	167.2	1.46	2
DBR 27	584-028614	16.2 16.7	06:23:14.51+26:45:57.0	2015.92	167.6	3.43	1
DBR 28	584-028640	13.6 17.8	06:23:19.98+26:37:18.1	2015.93	202.8	3.98	2
DBR 29	583-028515	16.2 16.8	06:23:21.81+26:35:34.4	2015.93	270.1	1.15	2
DBR 30	583-028563	13.4 17.8	06:23:31.83+26:35:33.1	2015.93	130.7	2.67	2
DBR 31	583-028527	13.8 17.0	06:23:24.17+26:31:44.5	2015.93	357.7	2.16	2
DBR 32	583-028537	16.5 18.4	06:23:25.95+26:31:21.9	2015.93	158.8	1.74	2
DBR 33	707-109950	14.6 15.8	23:03:04.53+51:16:32.6	2015.793	60.1	2.71	6
DBR 34	707-109914	15.6 16.5	23:02:52.44+51:21:30.7	2015.790	325.8	1.77	5
DBR 35	708-113278	13.5 16.1	23:02:21.70+51:24:45:6.7	2015.784	98.2	2.02	3
DBR 36	707-109971	14.8 16.3	23:03:13.13+51:19:12.5	2015.795	255.0	2.16	3
DBR 37	708-113378	17.0 18.7	23:02:48.80+51:24:54:9.0	2015.783	81.1	1.16	2
DBR 38	707-109869	16.3 17.6	23:02:39.58+51:18:32.6	2015.786	224.0	1.45	4
DBR 39 AB	707-110034	15.9 16.9	23:03:31.73+51:18:46.6	2015.790	97.9	12.03	1
DBR 39 AC	707-110034	15.9 17.6	23:03:31.73+51:18:46.6	2015.790	111.4	5.34	1
DBR 39 AD	707-110034	15.9 17.7	23:03:31.73+51:18:46.6	2015.790	121.5	4.93	1
DBR 39 CD*	None	17.6 17.7	23:03:32.27+51:18:44.6	2015.790	230.4	1.38	1
DBR 40	707-110063	15.5 16.0	23:03:43.16+51:18:42.2	2015.784	213.7	4.71	2
DBR 41	707-109895	15.7 17.5	23:02:45.86+51:23:06.9	2015.784	39.7	1.76	2
DBR 42	<u>1414-0479010</u>	16.4 17.2	23:03:15.56+51:25:13.7	2015.790	271.9	2.40	4
DBR 43	707-110249	15.0 17.6	23:04:51.66+51:18:52.7	2015.801	91.2	2.21	2
DBR 44	<u>1413-0487341</u>	16.8 17.0	23:03:56.22+51:22:49.0	2015.791	346.9	4.14	3
DBR 45	707-110064	15.5 16.2	23:03:43.43+51:18:46.0	2015.809	213.8	4.72	1
DBR 46	708-113710	13.6 16.2	23:04:28.82+51:25:53.3	2015.809	302.9	2.83	1
DBR 47	707-109988	13.0 15.9	23:03:18.66+51:19:15.1	2015.875	113.0	2.23	1
DBR 48	<u>1414-0479625</u>	17.1 17.5	23:04:04.17+51:27:23.9	2015.809	219.9	1.33	1
DBR 49	707-110076	15.8 16.1	23:03:47.48+51:20:31.0	2015.809	218.9	4.95	1
DBR 50	707-110015	16.3 18.1	23:03:25.05+51:20:23.5	2015.809	346.1	1.43	1

\* The component C is located at about  $2''$  west of USNO-B1.0 1413-0487076

## NEW DOUBLE STARS

Discovered by: A. Debackère with the LCOGT network telescopes:  
T2m Faulkes Telescope North, Hawaii and T1m Mac Donald, Texas  
(continuation)

STAR	UCAC4 USNO-B1.0	Mag.	Coord. 2000	Epoch	$\theta$ ( $^{\circ}$ )	$\rho$ ( $''$ )	nights
DBR 51	707-110031	16.1	17.9 23:03:31.14+51:23:35.3	2015.798	256.2	1.54	2
DBR 52	707-110141	15.6	17.8 23:04:11.47+51:21:23.7	2015.809	96.0	3.43	1
DBR 53	708-113707	15.8	18.6 23:04:27.40+51:26:25.9	2015.809	208.6	2.22	1
DBR 54	<u>1413-0487341</u>	16.4	16.5 23:03:56.23+51:22:47.3	2015.803	6346.7	4.17	3
DBR 55	707-109911	15.5	15.9 23:02:51.16+51:18:14.9	2015.791	619.9	0.80	4
DBR 56	<u>1134-0054304</u>	17.6	17.7 04:04:46.14+23:28:28.1	2015.877	13.9	3.84	1
DBR 57	571-011176	16.6	16.9 04:24:12.83+24:11:45.7	2015.877	255.5	4.80	1
DBR 58 PaPb*	762-029118	11.9	12.5 04:08:09.04+62:20:07.1	2015.877	226.5	0.94	1
DBR 59	708-113245	15.5	18.5 23:02:09.78+51:25:10.6	2015.829	205.6	2.36	2
DBR 60	707-109787	13.8	17.1 23:02:09.62+51:23:00.6	2015.829	325.8	2.43	2
DBR 61	<u>1413-0486352</u>	17.7	18.8 23:02:30.34+51:22:15.9	2015.829	45.9	1.78	2
DBR 62	707-109896	13.2	17.0 23:02:45.88+51:19:24.1	2015.829	132.9	4.64	5
DBR 63	<u>1413-0486312</u>	17.8	18.1 23:02:27.26+51:19:26.0	2015.829	103.0	1.38	2
DBR 64	<u>1414-0478617</u>	18.2	18.8 23:02:43.57+51:25:03.7	2015.829	9.6	1.74	2
DBR 65	708-113707	15.8	18.1 23:04:27.38+51:26:25.8	2015.801	209.8	2.19	2
DBR 66	708-113710	13.5	16.1 23:04:28.79+51:25:53.1	2015.801	302.8	2.67	2
DBR 67	708-113735	14.3	18.1 23:04:35.35+51:27:11.3	2015.801	220.4	3.51	2
DBR 68	708-113757	16.2	16.7 23:04:43.90+51:26:57.7	2015.801	185.9	1.45	2
DBR 69	708-113845	14.9	18.0 23:05:11.29+51:27:02.8	2015.801	176.8	3.05	2
DBR 70	708-113818	15.6	18.5 23:05:00.87+51:25:22.3	2015.801	34.9	4.11	2
DBR 71	708-113833	14.1	17.1 23:05:07.77+51:24:51.7	2015.801	28.5	4.08	2
DBR 72	707-110270	15.8	18.2 23:05:01.26+51:23:13.5	2015.801	312.4	2.76	2
DBR 73	707-110205	15.9	16.5 23:04:38.52+51:23:52.3	2015.795	111.3	4.13	3
DBR 74	707-110210	17.6	18.4 23:04:38.54+51:23:26.4	2015.795	92.8	4.17	3
DBR 75	708-113673	16.6	16.6 23:04:14.03+51:24:26.6	2015.801	50.2	3.63	2
DBR 76	707-110141	15.2	17.5 23:04:11.46+51:21:23.6	2015.795	96.3	3.31	3
DBR 77	707-110231	15.2	17.1 23:04:46.79+51:22:38.4	2015.795	71.5	4.75	3
DBR 78 AB	707-110237	16.3	16.6 23:04:48.37+51:21:53.4	2015.795	226.6	6.42	3
DBR 78 AC	707-110237	16.3	17.2 23:04:48.37+51:21:53.4	2015.795	288.5	3.72	3
DBR 79	707-110256	16.1	18.4 23:04:52.90+51:21:07.1	2015.795	307.3	3.41	3
DBR 80	<u>1413-0487845</u>	17.9	18.3 23:04:43.15+51:19:03.7	2015.801	101.9	2.39	2
DBR 81	707-110173	15.9	18.2 23:04:24.28+51:19:16.0	2015.795	43.1	4.03	3
DBR 82	<u>1413-0487641</u>	17.6	19.1 23:04:26.54+51:19:29.3	2015.801	7.4	2.55	2

\* The component P of HZG 2 OP has a companion, separation about 1''

## NEW DOUBLE STARS

Discovered by: A. Debackère with the LCOGT network telescopes:  
T2m Faulkes Telescope North, Hawaii and T1m Mac Donald, Texas  
(continuation)

STAR	UCAC4 USNO-B1.0	Mag.	Coord. 2000	Epoch	$\theta$ ( $^{\circ}$ )	$\rho$ ( $''$ )	nights
DBR 83	707-110227	15.9 18.0	23:04:45.98+51:18:17.7	2015.795	345.2	4.44	3
DBR 84	707-109996	16.3 17.6	23:03:20.84+51:21:23.0	2015.875	275.9	1.56	1
DBR 85	707-109973	13.5 16.4	23:03:13.97+51:15:35.3	2015.875	227.3	2.15	1
DBR 86	<u>1413-0503194</u>	19.0 19.5	23:03:09.52+51:20:17.2	2015.787	327.2	62.49	1
DBR 87	613-003361	18.6 20.8	01:07:17.30+32:27:04.0	2015.952	108.3	1.58	1
DBR 88 AB	<u>1224-0019281</u>	16.7 18.2	01:07:08.27+32:24:40.0	2015.952	317.6	13.74	1
DBR 88 AC	<u>1224-0019281</u>	16.7 19.3	01:07:08.27+32:24:40.0	2015.952	74.4	6.28	1
DBR 88 AD	<u>1224-0019281</u>	16.7 21.0	01:07:08.27+32:24:40.0	2015.952	199.2	2.91	1

## PAPERS PUBLISHED IN 2015

1. ALDORETTA, E. J. et al.: *The multiplicity of massive stars: a high angular resolution survey with the HST fine guidance sensor*. *Astron. J.* **149**, 26 (2015).
2. ALLEN, C., COSTERO, R. & HERNÁNDEZ, M.: *The dynamical future of the mini-cluster  $\theta^1$  Ori B*. *Astron. J.* **150**, 167 (2015).
3. ALONSO-FLORIANO, F. J. et al.: *Reaching the boundary between stellar kinematic groups and very wide binaries III. Sixteen new stars and eight new wide systems in the  $\beta$  Pictoris moving group*. *Astron. Astroph.* **583**, A85 (2015).
4. ANDERSON, R. I. et al.: *Revealing  $\delta$  Cephei's secret companion and intriguing past*. *Astrophys. J.* **804**, 144 (2015).
5. ANDRADE, M. & DOCOBO, J. A.: *The dynamical evolution of the multiple stellar system  $\alpha$  Gem*. *Astron. Soc. of the Pacific Conf. Ser.* **496**, 94 (2015).
6. ANDREWS, J. J. et al.: *Evolutionary channels for the formation of double neutron stars*. *Astrophys. J.* **801**, 32 (2015).
7. ANDREWS, J. J. et al.: *Constraints on the initial-final mass relation from wide double white dwarfs*. *Astrophys. J.* **815**, 63 (2015).
8. ARDILA, D. R. et al.: *Magnetospheric accretion in close Pre-main-sequence binaries*. *Astrophys. J.* **811**, 131 (2015).

9. ARGYLE, R. W., ALYNER, A. & VAN LEEUWEN, F.: *Micrometric measures and orbits of southern visual double stars* . Astron. Nach. **336**, (4), 378 (2015).
10. AZULAY, R. et al.: *Dynamical masses of the low-mass stellar binary AB Doradus B*. Astron. Astroph. **578**, A16 (2015).
11. BALAJI, B. et al.: *Tracking the stellar longitudes of starspots in short-period Kepler binaries*. Mont. Not. RAS **448**, (1), 429 (2015).
12. BALEGA, Y. Y. et al.: *Physical properties of the massive magnetic binary  $\theta^1$  Ori C components*. Astron. Soc. of the Pacific Conf. Ser. **494**, 57 (2015).
13. BARDALEZ GAGLIUFFI, D. C., GELINO, C. R. & BURGASSER, A. J.: *High resolution imaging of very low mass spectral binaries: Three resolved systems and detection of orbital motion in an L/T transition binary*. Astron. J. **150**, 163 (2015).
14. BARON, F. et al.: *Discovery and characterization of wide binary systems with a very low mass component*. Astrophys. J. **802**, 37 (2015).
15. BOFFIN, H. M. J.: *Mass-ratio distribution of extremely low-mass white dwarf binaries*. Astron. Astroph. **575**, L13 (2015)
16. BOND, H. E. et al.: *Hubble Space Telescope astrometry of the Procyon system*. Astrophys. J. **813**, 106 (2015).
17. BOTTOM, M. et al.: *Resolving the delta Andromedae spectroscopic binary with direct imaging*. Astrophys. J. **809**, 11 (2015).
18. BRIGGS, G. P. et al.: *Merging binary stars and the magnetic white dwarfs*. Mont. Not. RAS **447**, (2), 1713 (2015).
19. BURGASSER, A. J. et al.: *Radio emission and orbital motion from the close-encounter star-brown dwarf binary wise j072003.20-084651.2*. Astron. J. **150**, 180 (2015).
20. BUTLER, C. J. et al.: *A multiwavelength study of the M dwarf binary YY Geminorum*. Mont. Not. RAS **446**, (4), 4205 (2015).
21. CHULKOV, D. et al.: *Detection of unresolved binaries with multicolor photometry*. Baltic Astron. **24**, 137 (2015).
22. COLLADO, A. et al.: *A new massive double-lined spectroscopic binary system: The Wolf-Rayet star WR?68a*. Astron. Astroph. **581**, A49 (2015)
23. CORONADO, J. & CHANAMÉ, J.: *assembling the largest, most distant sample of halo wide binaries for galactic structure and dynamics* Rev. Mex. A. A. Conf. Ser. **46**, 61 (2015).
24. CORONADO, J. et al.: *Orbital and physical parameters of eclipsing binaries from the ASAS catalogue ? VII. V1200 Centauri: a bright triple in the Hyades moving group*. Mont. Not. RAS **448**, (2), 1937 (2015).

25. CSÉPÁNY, G. et al.: *Examining the T Tauri system with SPHERE*. *Astron. Astroph.* **578**, L9 (2015)
26. CUNTZ, M. : *S-type and P-type habitability in stellar binary systems: A comprehensive approach. II. Elliptical orbits*. *Astrophys. J.* **798**, 101 (2015).
27. CURÉ, M. et al.: *A method to deconvolve mass ratio distribution of binary stars* . *Astron. Astroph.* **573**, A86 (2015).
28. CVETKOVIĆ, Z., PAVLOVIĆ, R. & BOEVA, S.: *CCD measurements of double and multiple stars at NAO Rozhen and ASV in 2012. Four linear solutions*. *Astron. J.* **149**, 150 (2015).
29. DAEMGEN, S. et al.: *Sub-stellar companions and stellar multiplicity in the Taurus star-forming region*. *Astrophys. J.* **799**, 155 (2015).
30. DANILOVICH, T. et al. : *Classifying the secondary component of the binary star W Aquilae*. *Astron. Astroph.* **574**, A23 (2015).
31. DE ROSA, R. J. et al.: *Astrometric confirmation and preliminary orbital parameters of the young exoplanet 51 Eridani b with the GEMINI planet imager*. *Astrophys. J. Lett.* **814**, L3 (2015).
32. DIMITROV, W. et al.: *V342 Andromedae B is an eccentric-orbit eclipsing binary*. *Astron. Astroph.* **575**, A101 (2015).
33. DOCOBO, J. A. & ANDRADE, M.: *On the Hipparcos accuracy using binary stars as a calibration tool*. *Astron. J.* **149**, 45 (2015).
34. DUNSTALL, P. R. et al.: *he VLT-FLAMES Tarantula Survey XXII. Multiplicity properties of the B-type stars*. *Astron. Astroph.* **580**, A93 (2015).
35. DUPUY, T. J., LIU, M. C. & LEGGETT, S. K.: *Discovery of a low-luminosity, tight substellar binary at the T/Y transition*. *Astrophys. J.* **803**, 102 (2015).
36. DUPUY, T. J. et al. : *The mass-luminosity relation in the L/T transition: Individual dynamical masses for the new J-band flux reversal binary SDSSj105213.51+442255.7AB*. *Astrophys. J.* **805**, 56 (2015).
37. FEKEL, F. C.: *HD 207651: A composite spectrum triple system*. *Astron. J.* **149**, 83 (2015).
38. FEKEL, F. C. et al.: *New precision orbits of bright double-lined spectroscopic binaries. IX. HD 54371, HR 2692, and 16 Ursa Majoris*. *Astron. J.* **149**, 63 (2015).
39. FEKEL, F. C. et al.: *Infrared spectroscopy of symbiotic stars. X. Orbits for three S-type systems: V1044 Centauri, Hen 3-1213, and SS 73-96*. *Astron. J.* **150**, 48 (2015).
40. FU, W., LUBOW, S. H. & MARTIN, R. G.: *The Kozai-Lidov mechanism in hydrodynamical disks. II. Effects of binary and disk parameters*. *Astrophys. J.* **807**, 75 (2015).

41. FUHRMANN, K & CHINI, R.: *Multiplicity among F-type stars. II.* *Astrophys. J.* **809**, 107 (2015).
42. GAMEN, R. et al.: *Spectroscopic and photometric analysis of the early-type spectroscopic binary HD 161853 in the centre of an H II region.* *Astron. Astroph.* **584**, A7 (2015).
43. GARCÍA, E. V. et al.: *On the binary frequency of the lowest mass members of the Pleiades with Hubble Space Telescope wide field camera 3.* *Astrophys. J.* **804**, 65 (2015).
44. GE, H. et al.: *Adiabatic mass loss in binary stars. II. From zero-age main sequence to the base of the giant branch.* *Astrophys. J.* **812**, 40 (2015).
45. GEBRAN, M. et al.: *The signature of diffusion in the binary system of omicron Leonis: a key for AmFm scenarios?.* *Astrophys. Space Science* **357** (2), 137 (2015).
46. GEIER, S. et al.: *The population of white dwarf binaries with hot subdwarf companions.* *Astron. Soc. of the Pacific Conf. Ser.* **493**, 475 (2015).
47. GIES, D. R. et al.: *Kepler eclipsing binaries with stellar companions.* *Astron. J.* **150**, 178 (2015).
48. GRELLMANN, R. et al.: *New constraints on the multiplicity of massive young stars in Upper Scorpius.* *Astron. Astroph.* **578**, A84 (2015)
49. GRIFFIN, R. E. M. & GRIFFIN, R. F.: *Composite spectra: XX. 45 Cancri. Two stars with very similar masses but quite different evolutionary states.* *Astron. Nach.* **336**, (2), 178 (2015)
50. GRIFFIN, R. F.: *Spectroscopic binary orbits from photoelectric radial velocities. Paper 240: BD+59 224, HD 9592, HD 10171, HD 11738, and nu Ceti.* *The Observatory* **135**, 15 (2015).
51. GRIFFIN, R. F.: *Spectroscopic binary orbits from photoelectric radial velocities. Paper 241: HR 1884, HD 174103, HD 182563, and HR 8442, with a note on zeta Cephei.* *The Observatory* **135**, 71 (2015).
52. GRIFFIN, R. F.: *Spectroscopic binary orbits from photoelectric radial velocities. Paper 242: HD 471, HD 3791, HD 4703, and HD 8739.* *The Observatory* **135**, 122 (2015).
53. GRIFFIN, R. F.: *Spectroscopic binary orbits from photoelectric radial velocities. Paper 243: HD 20577, HD 23257, HD 38232, and HD 130669.* *The Observatory* **135**, 193 (2015).
54. GRIFFIN, R. F.: *Spectroscopic binary orbits from photoelectric radial velocities. Paper 244: Six Uppgren stars in the North-Galactic-Pole field and the bright star 4 Comae Berenices, a newly discovered SB2.* *The Observatory* **135**, 265 (2015).



55. GRIFFIN, R. F.: *Spectroscopic binary orbits from photoelectric radial velocities. Paper 245: HD 26083, HD 26441, HD 51001, and HD 85843.* The Observatory **135**, 321 (2015).
56. GRIFFIN, R. E. M. & GRIFFIN, R. F.: *Composite spectra: XX. 45 Cancri.* Astron. Nach. **336**, (2), 178 (2015)
57. GUERRERO, C. A. & ORLOV, V. G.: *Stellar multiplicity of the open cluster ASCC 113* Rev. Mex. A. A. Conf. Ser. **46**, 44 (2015).
58. GUERRERO, C. A. et al.: *Stellar multiplicity of the open cluster Melotte 111.* Astron. J. **150**, 16 (2015).
59. GULLIKSON, K. et al.: *Mining planet search data for binary stars: the  $\psi^1$  Draconis system.* Astrophys. J. **815**, 62 (2015).
60. HARMANEC, P. et al. : *Properties and nature of Be stars - 30. Reliable physical properties of a semi-detached B9.5e+G8III binary BR CMi = HD 61273 compared to those of other well studied semi-detached emission-line binaries.* Astron. Astroph. **573**, A107 (2015)
61. HARTKOPF, W. I. & MASON, B. D.: *Speckle interferometry at the U.S. Naval Observatory. XX.* Astron. J. **150**, 136 (2015)
62. HARTMANN, M. & HATZES, A. P.: *A radial-velocity survey of Ap stars with HARPS. I. HD 42659: The discovery of the first spectroscopic binary around a rapidly oscillating Ap star.* Astron. Astroph. **582**, A84 (2015)
63. HAUCK, N. & GRIFFIN, R. F.: *A bright giant and a giant discovered in the binary V1375 Orionis.* The Observatory **135**, 6 (2015).
64. HETTINGER, T. et al.: *Statistical time-resolved spectroscopy: a higher fraction of short-period binaries for metal-rich f-type dwarfs in SDSS.* Astrophys. J. Lett. **806**, L2 (2015).
65. HORCH E. P. et al.: *Observations of binary stars with the differential speckle survey instrument. V. Toward an empirical metal-poor mass-luminosity relation.* Astron. J. **149**, 151 (2015).
66. HORCH E. P. et al.: *Observations of binary stars with the differential speckle survey instrument. V. Measures during 2014 at the discovery channel telescope.* Astron. J. **150**, 151 (2015).
67. HUÉLAMO, N. et al.: *WISE J061213.85-303612.5: a new T-dwarf binary candidate.* Astron. Astroph. **578**, A1 (2015)
68. HWANG, J. et al.: *Stability and coalescence of massive twin binaries.* Astrophys. J. **806**, 135 (2015).
69. ISAEVA, A. A., KOVALEVA, D. A. & MALKOV, O. Y.: *Visual binaries: cross-matching and compiling of a comprehensive list.* Baltic Astron. **24**, 157 (2015).

70. JANG-CONDELL, H.: *On the likelihood of planet formation in close binaries*. Astrophys. J. **799**, 147 (2015).
71. JENKINS, J. S. et al.: *The observed distribution of spectroscopic binaries from the Anglo-Australian Planet Search*. Mont. Not. RAS **453**, (2), 1439 (2015).
72. KALUZNY J. et al.: *The cluster ages experiment(CASE). VII. Analysis of two eclipsing binaries in the globular cluster NGC 6362*. Astron. J. **150**, 155 (2015).
73. KAWKA, A. et al.: *New binaries among UV-selected, hot subdwarf stars and population properties*. Mont. Not. RAS **450**, (4), 3514 (2015).
74. KEEN, M. A. et al.: *KIC 10080943: a binary star with two  $\gamma$  Doradus/ $\delta$  Scuti hybrid pulsators. Analysis of the g modes*. Mont. Not. RAS **454**, (2), 1792 (2015).
75. KHALIULLINA, A. I.: *A third body as the origin of the orbital-period variations in the eclipsing binaries TW Cas and BE Vul*. Astron. Reports **59**, (7) 717 (2015)
76. KHOVRITCHEV, M. Y. & KULIKOVA, A. M.:  *$\Delta\mu$  binaries among stars with large proper motions*. Astron. Letters **41**, (12) 833 (2015)
77. KIMINKI, D. C. et al.: *Predicting GAIA's parallax distance to the Cygnus OB2 association with eclipsing binaries*. Astrophys. J. **811**, 85 (2015).
78. KIYAEVA, O. V. & GORYNYA, N. A.: *Orbit of the nearby visual double star GJ 767*. Astron. Letters **41**, (8) 417 (2015).
79. KIYAEVA, O. V. & ORLOV, V. V.: *Selected multiple stars of the Pulkovo program*. Astrophys. Bull. **70**, (4) 430 (2015)
80. KJURKCHIEVA, D. & DIMITROV, D.: *Light curve solutions of the ultrashort-period Kepler binaries*. Astron. Nach. **336**, (2), 153 (2015)
81. KLOPPENBORG, B. K. et al.: *Interferometry of  $\epsilon$  Aurigae: characterization of the asymmetric eclipsing disk*. Astrophys. J. Supp. Ser. **220**, 14 (2015).
82. KOENIGSBERGER, G., BROTT, I. & MORENO, E.: *Asynchronous binaries, energy dissipation and turbulent viscosity*. Astron. Soc. of the Pacific Conf. Ser. **496**, 264 (2015).
83. KOLBAS, V. et al.: *Spectroscopically resolving the Algol triple system*. Mont. Not. RAS **451**, (4), 4150 (2015).
84. KOVALEVA, D. A. et al.: *Bsdb: a new consistent designation scheme for identifying objects in binary and multiple stars*. Baltic Astron. **24**, 185 (2015).
85. KOVALEVA, D. A. et al.: *Statistical analysis of a comprehensive list of visual binaries*. Baltic Astron. **24**, 367 (2015).
86. KOVTYUKH, V. et al.: *Discovery of blue companions to two southern Cepheids: WW Car and FN Vel*. Mont. Not. RAS **448**, (4), 3567 (2015).

87. KOZYREVA, V. S. et al.: *An Exo-Jupiter candidate in the eclipsing binary FL Lyr*. *Astron. Reports* **59**, (11-12) 1036 (2015)
88. KREMER, K., SEPINSKY, J. & KALOGERA, V.: *Long-term evolution of double white dwarf binaries accreting through direct impact*. *Astrophys. J.* **806**, 76 (2015).
89. KUPFER, T. et al.: *Hot subdwarf binaries from the MUCHFUSS project. Analysis of 12 new systems and a study of the short-period binary population*. *Astron. Astroph.* **576**, A44 (2015).
90. KUPFER, T. et al.: *Phase-resolved spectroscopy and Kepler photometry of the ultracompact AM CVn binary SDSS j190817.07+394036.4*. *Mont. Not. RAS* **453**, (1), 483 (2015).
91. LACY, C.H. S. et al.: *Absolute properties of the eclipsing binary star IM Persei*. *Astron. J.* **149**, 34 (2015).
92. LOMAX, O. et al.: *Simulations of star formation in Ophiuchus II. Multiplicity*. *Mont. Not. RAS* **447**, (2), 1550 (2015).
93. MAHY, L. et al.: *A spectroscopic investigation of the O-type star population in four Cygnus OB associations. II. Determination of the fundamental parameters*. *Astron. Astroph.* **577**, A23 (2015).
94. MAKAROV, V. V. & UNWIN, S. C. : *Radial velocities and binarity of southern SIM grid stars I. time*. *Mont. Not. RAS* **446**, (2), 2055 (2015).
95. MALKOV, O. Y., TESSEMA, S. B. & KNIAZWV, A. Y.: *Binary star database: binaries discovered in non-optical bands*. *Baltic Astron.* **24**, 395 (2015).
96. MANZOORI, D., ABBASVAND, S. & NAJAFINEZHAD, F.: *Analysis of the photoelectric light curve and the orbital period variations of the binary system UU Andromedae*. *Astron. Nach.* **336**, (6), 570 (2015)
97. MARKS, M. et al.: *M-dwarf binaries as tracers of star and brown dwarf formation*. *Mont. Not. RAS* **452**, (1), 1014 (2015).
98. MAROCCO, F. et al.: *A large spectroscopic sample of L and T dwarfs from UKIDSS LAS: peculiar objects, binaries, and space density*. *Mont. Not. RAS* **449**, (4), 3651 (2015).
99. MARTIN, D. V., MAZEH, T. & FABRYCKY, D. C.: *No circumbinary planets transiting the tightest Kepler binaries - a possible fingerprint of a third star*. *Mont. Not. RAS* **453**, (4), 3554 (2015).
100. MATVIENKO, A. S. & ORLOV, V. V.: *Restriction of motions in wide pairs in the Galactic field*. *Astron. Letters* **41**, (6) 267 (2015).
101. MATVIENKO, A. S. & ORLOV, V. V.: *Motions in wide pairs within the framework of MOND*. *Astron. Letters* **41**, (12) 824 (2015).

102. MATVIENKO, A. S., KIYAEVA, O. V. & ORLOV, V. V.: *Dynamics of the Castor multiple system*. *Astron. Letters* **41**, (1-2) 43 (2015).
103. MAXTED, P. F. L. et al.: *Precise mass and radius measurements for the components of the bright solar-type eclipsing binary star V1094 Tauri*. *Astron. Astroph.* **578**, A25 (2015).
104. MENNICKENT, R. E. et al.: *Fundamental parameters of the close interacting binary HD 170582 and its luminous accretion disc*. *Mont. Not. RAS* **448**, (2), 1137 (2015).
105. MESHKAT, T. et al.: *Discovery of a low-mass companion to the F7V star HD 984*. *Mont. Not. RAS* **453**, (3), 2378 (2015).
106. MONTET, B. T. et al.: *Dynamical masses of young M dwarfs: masses and orbital parameters of GJ 3305 AB, the wide binary companion to the imaged exoplanet host 51 Eri*. *Astrophys. J. Lett.* **813**, L11 (2015).
107. MOURARD, D. et al.: *Spectral and spatial imaging of the Be+sdO binary  $\phi$  Persei*. *Astron. Astroph.* **577**, A51 (2015).
108. MUTERSPAUGH, M. W. et al.: *Predicting the  $\alpha$  Comae Berenices time of eclipse: How 3 ambiguous measurements out of 609 caused a 26 year binary's eclipse to be missed*. *Astron. J.* **150**, 140 (2015).
109. OKS, E.: *Stable conic-helical orbits of planets around binary stars: analytical results*. *Astrophys. J.* **804**, 106 (2015).
110. ORLOV, V. G. & VOITSEKHOVICH, V. V.: *Speckle interferometry at the Observatorio Astronómico Nacional. VI*. *Rev. Mex. A. A.* **51**, 65 (2015).
111. PEARCE, T. D., WYATT, M. C. & KENNEDY, G. M.: *Constraining the orbits of sub-stellar companions imaged over short orbital arcs*. *Mont. Not. RAS* **448**, (4), 3679 (2015).
112. PETROVICH, C.: *Steady-state planet migration by the Kozai-Lidov mechanism in stellar binaries*. *Astrophys. J.* **799**, 27 (2015).
113. PUGH, T., GRAY, D. F. & GRIFFIN, R. F.: *The orbit and variations of  $\delta$  Sagittae*. *Mont. Not. RAS* **454**, (3), 2344 (2015).
114. RAPPAPORT, S. et al.: *Discovery of two new thermally bloated low-mass white dwarfs among the kepler binaries*. *Astrophys. J.* **803**, 82 (2015).
115. RICE, E. L. et al.: *A new method for characterizing very low-mass companions with low-resolution near-infrared spectroscopy*. *Pub. Astron. Soc. of the Pacific* **127**, 479 (2015).
116. RICHARDSON, N. D. et al.: *HST/STIS ultraviolet spectroscopy of the components of the massive triple star  $\delta$  Ori A*. *Astrophys. J.* **808**, 88 (2015).

117. RIDDLE, R. L. et al.: *A survey of the high order multiplicity of nearby solar-type binary stars with Robo-AO*. *Astrophys. J.* **799**, 4 (2015).
118. ROBERTS, L. C. Jr. et al.: *Know the star, know the planet. III. Discovery of late-type companions to two exoplanet host stars*. *Astron. J.* **149**, 118 (2015).
119. ROBERTS, L. C. Jr. et al.: *Know the star, know the planet. IV. A stellar companion to the host star of the eccentric exoplanet HD 8673b*. *Astron. J.* **149**, 144 (2015).
120. ROBERTS, L. C. Jr. et al.: *Observations of hierarchical solar-type multiple star systems*. *Astron. J.* **150**, 130 (2015).
121. ROETTENBACHER, R. M. et al.: *Detecting the companions and ellipsoidal variations of RS CVn primaries. I.  $\sigma$  Geminorum*. *Astrophys. J.* **807**, 23 (2015).
122. ROETTENBACHER, R. M. et al.: *Detecting the companions and ellipsoidal variations of RS CVn primaries. II.  $\alpha$  Draconis, a candidate for recent low-mass companion ingestion*. *Astrophys. J.* **809**, 159 (2015).
123. SAHLMANN, J. & LAZORENKO, P. F.: *Mass ratio of the 2 pc binary brown dwarf LUH 16 and limits on planetary companions from astrometry*. *Mont. Not. RAS Lett.* **453**, (1), L103 (2015).
124. SAHLMANN, J. et al.: *Astrometric planet search around southern ultracool dwarfs III. Discovery of a brown dwarf in a 3-year orbit around DE0630-18*. *Astron. Astroph.* **577**, A15 (2015).
125. SCARDIA, M. et al.: *Speckle observations with PISCO in Merate (Italy): XIV. Astrometric measurements of visual binaries in 2013 and new orbits for ADS 1097, 5871, 7203, 7775, 9378, 9578, and 11186*. *Astron. Nach.* **336**, (4), 388 (2015)
126. SCHLEICHER, D. R. G. et al.: *Planet formation in post-common-envelope binaries*. *Astron. Nach.* **336**, (5), 458 (2015)
127. SCHNEIDER, F.R.N. et al.: *Evolution of mass functions of coeval stars through wind-mass loss and binary interactions*. *Astrophys. J.* **805**, 20 (2015).
128. SCHWARZ, R et al.: *Eclipse timing variations to detect possible Trojan planets in binary systems*. *Mont. Not. RAS* **453**, (3), 2308 (2015).
129. SCHWOPE, A. D. et al.: *Multi-epoch time-resolved photometry of the eclipsing polar CSS081231:071126+440405*. *Astron. Nach.* **336**, (1), 115 (2015)
130. SHEVCHENKO, I. I.: *Chaotic zones around gravitating binaries*. *Astrophys. J.* **799**, 8 (2015).
131. SIMÓN-DÍAZ, S. et al.: *Orbital and physical properties of the  $\sigma$  Ori Aa, Ab, B triple system*. *Astrophys. J.* **799**, 169 (2015).
132. SMITH, N. & TOMBLESON, R.: *Luminous blue variables are antisocial: their isolation implies that they are kicked mass gainers in binary evolution*. *Mont. Not. RAS* **447**, (1), 598 (2015).

133. SMULLEN, R. A. & KOBULNICKY, H. A.: *Heartbeat stars: spectroscopic orbital solutions for six eccentric binary systems*. *Astrophys. J.* **808**, 166 (2015).
134. TESKE, J. K. et al.: *A comparison of spectroscopic versus imaging techniques for detecting close companions to Kepler objects of interest*. *Astron. J.* **150**, 144 (2015).
135. THIES, I. et al.: *Characterizing the brown dwarf formation channels from the initial mass function and binary-star dynamics*. *Astrophys. J.* **800**, 72 (2015).
136. TOKOVININ, A.: *Spectroscopic subsystems in nearby wide binaries*. *Astron. J.* **150**, 177 (2015).
137. TOKOVININ, A., LATHAM, D. W. & MASON, B. D.: *The unusual quadruple system HD 91962 with a “planetary” architecture*. *Astron. J.* **149**, 195 (2015).
138. TOKOVININ, A. et al.: *Speckle interferometry at SOAR in 2014*. *Astron. J.* **150**, 50 (2015).
139. TORRES G. et al.: *Absolute dimensions of the metallic-line eclipsing binary V501 Monocerotis*. *Astron. J.* **150**, 154 (2015).
140. TORRES G. et al.: *Capella ( $\alpha$  Aurigae) revisited: new binary orbit, physical properties, and evolutionary state*. *Astrophys. J.* **807**, 26 (2015).
141. VOS, J. et al.: *Testing eccentricity pumping mechanisms to model eccentric long-period sdB binaries with MESA*. *Astron. Astroph.* **579**, A49 (2015)
142. WANG, J. et al.: *Influence of stellar multiplicity on planet formation. III. Adaptive optics imaging of Kepler stars with gas giant planets*. *Astrophys. J.* **806**, 248 (2015).
143. WARD-DUONG, K. et al.: *The M-dwarfs in Multiples (MinMs) survey - I. Stellar multiplicity among low-mass stars within 15 pc*. *Mont. Not. RAS* **449**, (3), 2618 (2015).
144. WILLIAMS, K. A. et al.: *Time-series spectroscopy of two candidate double degenerates in the open cluster NGC 6633*. *Astron. J.* **150**, 194 (2015).
145. WÖLLERT, M & BRANDNER, W.: *A Lucky Imaging search for stellar sources near 74 transit hosts*. *Astron. Astroph.* **579**, A129 (2015).
146. WÖLLERT, M et al.: *A Lucky Imaging search for stellar companions to transiting planet host stars*. *Astron. Astroph.* **575**, A23 (2015).
147. YOUNG, M. D. & CLARKE, C. J.: *Binary accretion rates: dependence on temperature and mass ratio*. *Mont. Not. RAS* **452**, (3), 3085 (2015).
148. ZASCHE, P. et al.: *Apsidal motion and a light curve solution for 13 LMC eccentric eclipsing binaries*. *Astron. J.* **150**, 183 (2015).

## ANNOUNCEMENTS

### BDB: THE BINARY STAR DATABASE

The Binary star DataBase (BDB) is the world’s principal database of binary and multiple systems of all observational types. The ongoing mission of BDB is to provide a comprehensive and easy-to-use database of fundamental information for known (cataloged) objects in multiple stellar systems. BDB contains data on physical and positional parameters of 240,000 components of 130,000 systems of multiplicity 2 and more, belonging to various observational types: visual, interferometric, spectroscopic, eclipsing, X-ray, etc. The current database is the result of a systematic integration of data from tens of heterogeneous sources of data — astronomical catalogues and surveys. BDB can be queried by star identifier, coordinates, and other parameters. Further information about BDB content and functionality is available at the BDB website (<http://bdb.inasan.ru>) and in various publications (e.g., Kaygorodov et al. 2012, *Baltic Astronomy* 21, 309; Kovaleva et al. 2015, *Astronomy and Computing* 11, 119).

A new version of BDB, with improved interface, drastically improved performance and enhanced visualization results, will be available in Oct 2015.

Due to necessity of a unified and consistent system for designation of objects in the database, Binary Star DataBase (BSDB) designation scheme for identifying objects in double and multiple systems was developed (Kovaleva et al. 2015, *Baltic Astronomy* 24, 185). The BSDB scheme covers all types of observational data. Three classes of objects (system, pair, component) introduced within the BSDB nomenclature provide correct links between objects and data, which is especially important for complex multiple stellar systems.

The principles underlying BSDB identifier compilation satisfy the “IAU Specifications concerning designations for astronomical radiation sources outside the solar system”. On Jul 2015 BSDB acronym was accepted by the IAU Registry and entered into the Reference Dictionary of Nomenclature of Celestial Objects.

Oleg Malkov, Dana Kovaleva and Pavel Kaygorodov

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### JEAN-PAUL ZAHN (1935 - 2015)

We were saddened to learn of the death of Jean-Paul Zahn, Emeritus astronomer at the Paris Observatory. Our esteemed friend and colleague passed away on July 15 2015.

Jean-Paul Zahn began his career in 1962 at the Institut d’Astrophysique de Paris in the group of Evry Schatzman. In 1966, he defended his dissertation there under the title “The tidal in a close double star”. In this work, he described the properties of tides in a close double star for the first time. In addition, he provided the first description of the physical mechanisms that act on the dynamic evolution of the system and the evolution of stellar components. In that same year, he was appointed to the position of Astronomer at the Nice Observatory of which he was the Director from 1972 to 1981.

While Paul Couteau and Paul Muller, distinguished members of Commission 26 “Double Stars”, observed the visual double star with the 74 cm and 50 cm refractors, welcomed Antoine Labeyrie whose first two interferometer telescopes opened the way for modern developments in the high angular resolution study of double stars. As a physicist in the field of fluid dynamics, the studies of Jean-Paul Zahn have made major contributions to the theory of the internal structure of stars and stellar evolution.

Regarding binary stars, he studied in detail the physical phenomena induced by the tidal such as non-adiabatic stellar oscillations generated by the periodic variation of the gravitational field (J. P. Zahn , 1970, 1975), the friction phenomena in the convective envelope and the evolution of a binary system under the effect of including the tidal circularization of the orbit, and the synchronization of stellar rotation and associated physical phenomena .

Jean-Paul Zahn was primarily a theoretician but he attached great importance to the “theory-observation” interface. He considered with great interest the spectroscopic and high angular resolution observations that allow the precise determination of fundamental stellar parameters necessary to test the internal structure of models of stellar evolution.

Jean-Paul Zahn was the Director of the Observatory of the Pic du Midi and Toulouse from 1981 to 1988 before joining the Paris Observatory in 1993.

Among his numerous national and international responsibilities, it should be noted that Jean-Paul Zahn was President of the IAU Commission 35, “Constitution of Stars”, from 1997-2000.

His enthusiasm and warm character will remain in our memories.

Daniel Bonneau

Honorary astronomer at Côte d’Azur Observatory

### **MERCEDES THARAM RICHARDS (1955 - 2016)**

It saddens me deeply to convey the message of the passing of one of the most prominent interacting binary scientists of our community.

Mercedes has been an inspiration and an idol to all, and a personal friend to many. Mercedes was the last President of IAU Commission 42 and I had the privilege of working closely with her during the past several years. She was a strong, balanced, and complete person with remarkable insights and unique talents. Mercedes will be profoundly missed.

Please join me in extending our heartfelt sympathies to her husband, Don, and daughters, Chandra and Suzanne.

With deep regrets,

Andrej Prsa

IAU Commission G1 president

More information at the website of Penn State Eberly College of Science:

<http://science.psu.edu/news-and-events/in-memoriam-mercedes-richards-1955-2016>



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The deadline for contributions to Information Circular No. 189 is:

June 15th 2016

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ISSN: 1024-7769