DEBCat:

CATALOGUE OF WELL-STUDIED DETACHED ECLIPSING BINARIES

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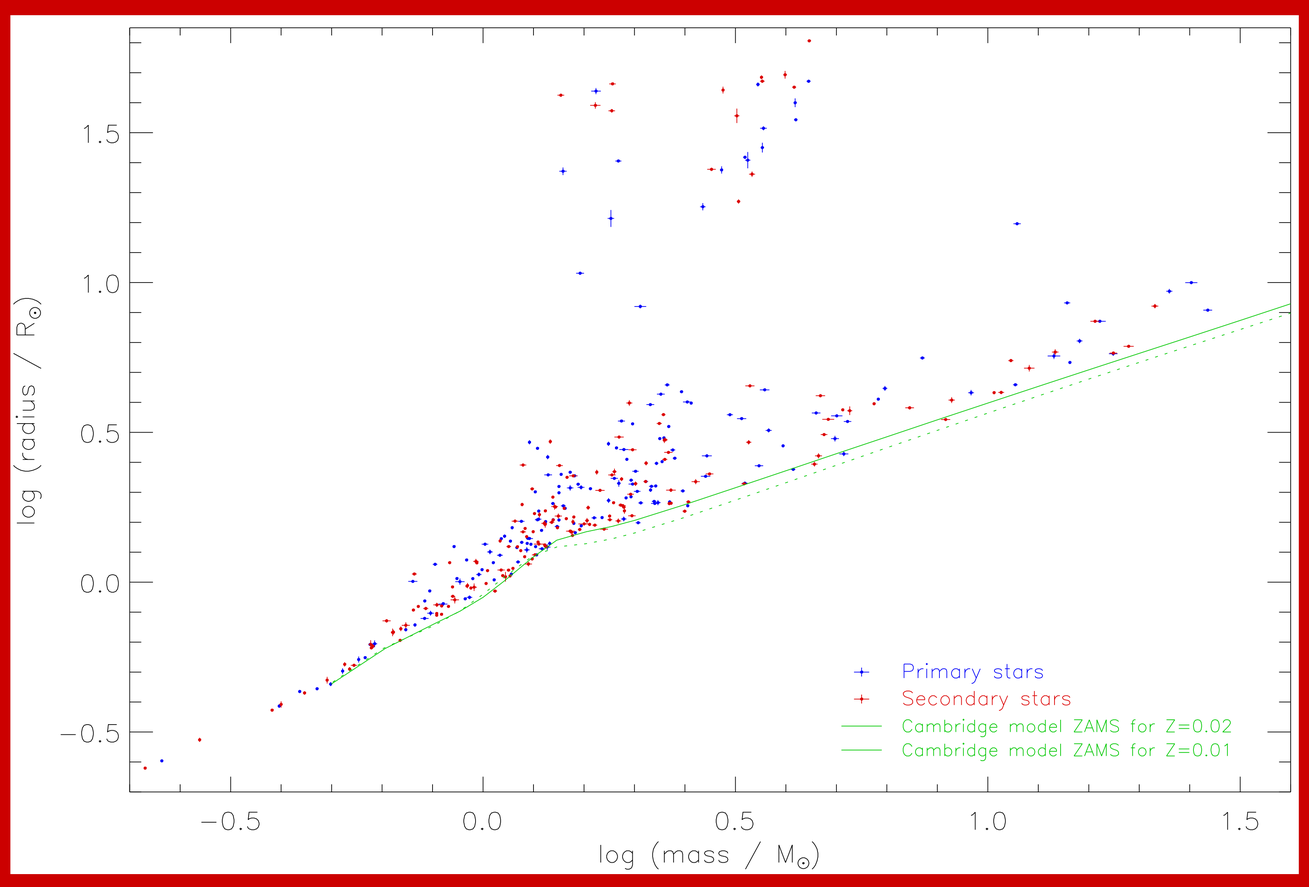
Detached eclipsing binary star systems (dEBs) are our primary source of measurements of the physical properties of stars. The masses, radii, and surface gravities of stars in dEBs can be measured empirically and to a precision and accuracy of 1% or better (e.g. Southworth et al., 2005, MNRAS, 363, 529). With an effective temperature measurement we can obtain their luminosities directly. dEBs are the main checks and calibrators for theoretical stellar models (e.g. Pols et al., 1998, MNRAS, 298, 525), and thus form the foundation of stellar and galactic astrophysics.

Important uses of dEBs include as direct distance indicators (Pietrzynski et al. 2013, *Nature*, 495, 76), calibrators of asteroseismic scaling relations (Frandsen et al., 2013, A&A, 556, A138), probes of the chemical evolution of massive stars (Pavlovski et al., 2009, MNRAS, 400, 791), tracers of binary evolutionary processes (Maxted et al., 2013, *Nature*, 498, 463), and characterisation of the host stars of extrasolar planets (Southworth, 2009, MNRAS, 394, 272).

The study of dEBs has a long history (see Stebbins, 1911, ApJ, 34, 112; Russell, 1912, ApJ, 35, 315). Catalogues of well-studied systems have been published by Popper (1967, ARA&A, 5, 85), Popper (1980, ARA&A, 18, 115), Harmanec (1988, BAICz, 39, 329), Andersen (1991, A&ARv, 3, 91) and most recently Torres, Andersen & Giménez (2010, A&ARv, 18, 67).

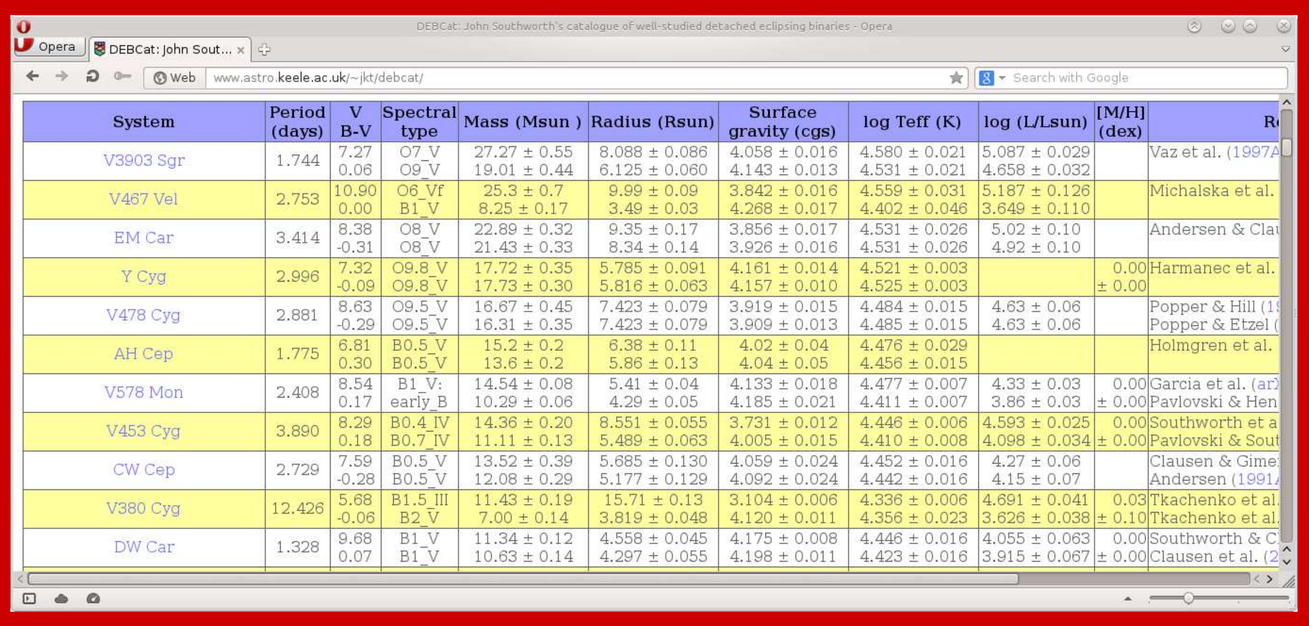


Plot of the masses and radii of the objects in DEBCat. The zero-age main sequences are from the Cambridge models (Pols et al., 1998, MNRAS, 298, 525) for metal abundances $Z = 0.02$ and 0.01.

In early 2006 I constructed a catalogue of well-studied dEBs by updating the list of objects compiled by Andersen (1991, A&ARv, 3, 91). From this point onwards new results from refereed journals have been added as and when they are published. The result is DEBCat, which is available at: `http://www.astro.keele.ac.uk/jkt/debcat/`. A changelog has been kept since February 2008. As of September 2014 the total number of objects in DEBCat is 170 (listed on the left and right of this poster).

The requirements for inclusion in DEBCat are:
① The evolution of the system has not been significantly affected by binarity. This restricts us to detached binary systems.
② The masses and radii of both components have been measured directly, i.e. without significant input from stellar theory, and to an accuracy of 2%. This restricts us to double-lined dEBs. The 2% limit is relaxed for a few interesting objects.
③ Measurements of the effective temperatures of both stars are available.

In future I will continue to maintain DEBCat, add measurements of the orbital eccentricity and apsidal motion period, lodge a version with CDS, and redesign the website (currently created from ASCII files by a FORTRAN77 code!).



System	Period (days)	V B-V	Spectral type	Mass (Msun)	Radius (Rsun)	Surface gravity (cgs)	log Teff (K)	log (L/Lsun)	[M/H] (dex)	R
V3903 Sgr	1.744	7.27 0.06	O7_V O9_V	27.27 ± 0.55 19.01 ± 0.44	8.088 ± 0.086 6.125 ± 0.060	4.058 ± 0.016 4.143 ± 0.013	4.580 ± 0.021 4.531 ± 0.021	5.087 ± 0.029 4.658 ± 0.032		Vaz et al. (1997A
V467 Vel	2.753	10.90 0.00	O6_Vf B1_V	25.3 ± 0.7 8.25 ± 0.17	9.99 ± 0.09 3.49 ± 0.03	3.842 ± 0.016 4.268 ± 0.017	4.559 ± 0.031 4.402 ± 0.046	5.187 ± 0.126 3.649 ± 0.110		Michalska et al.
EM Car	3.414	8.38 -0.31	O8_V O8_V	22.89 ± 0.32 21.43 ± 0.33	9.35 ± 0.17 8.34 ± 0.14	3.856 ± 0.017 3.926 ± 0.016	4.531 ± 0.026 4.531 ± 0.026	5.02 ± 0.10 4.92 ± 0.10		Andersen & Clau
Y Cyg	2.996	7.32 -0.09	O9.8_V O9.8_V	17.72 ± 0.35 17.73 ± 0.30	5.785 ± 0.091 5.816 ± 0.063	4.161 ± 0.014 4.157 ± 0.010	4.521 ± 0.003 4.525 ± 0.003		0.00 ± 0.00	Harmanec et al.
V478 Cyg	2.881	8.63 -0.29	O9.5_V O9.5_V	16.67 ± 0.45 16.31 ± 0.35	7.423 ± 0.079 7.423 ± 0.079	3.919 ± 0.015 3.909 ± 0.013	4.484 ± 0.015 4.485 ± 0.015	4.63 ± 0.06 4.63 ± 0.06		Popper & Hill (19 Popper & Etzel (
AH Cep	1.775	6.81 0.30	B0.5_V B0.5_V	15.2 ± 0.2 13.6 ± 0.2	6.38 ± 0.11 5.86 ± 0.13	4.02 ± 0.04 4.04 ± 0.05	4.476 ± 0.029 4.456 ± 0.015			Holmgren et al.
V578 Mon	2.408	8.54 0.17	B1_V: early_B	14.54 ± 0.08 10.29 ± 0.06	5.41 ± 0.04 4.29 ± 0.05	4.133 ± 0.018 4.185 ± 0.021	4.477 ± 0.007 4.411 ± 0.007	4.33 ± 0.03 3.86 ± 0.03	0.00 ± 0.00	Garcia et al. (ar Pavlovski & Hen
V453 Cyg	3.890	8.29 0.18	B0.4_IV B0.7_IV	14.36 ± 0.20 11.11 ± 0.13	8.551 ± 0.055 5.489 ± 0.063	3.731 ± 0.012 4.005 ± 0.015	4.446 ± 0.006 4.410 ± 0.008	4.593 ± 0.025 4.098 ± 0.034	0.00 ± 0.00	Southworth et a Pavlovski & Sout
CW Cep	2.729	7.59 -0.28	B0.5_V B0.5_V	13.52 ± 0.39 12.08 ± 0.29	5.685 ± 0.130 5.177 ± 0.129	4.059 ± 0.024 4.092 ± 0.024	4.452 ± 0.016 4.442 ± 0.016	4.27 ± 0.06 4.15 ± 0.07		Clausen & Gime Andersen (1991A
V380 Cyg	12.426	5.68 -0.06	B1.5_III B2_V	11.43 ± 0.19 7.00 ± 0.14	15.71 ± 0.13 3.819 ± 0.048	3.104 ± 0.006 4.120 ± 0.011	4.336 ± 0.006 4.356 ± 0.023	4.691 ± 0.041 3.626 ± 0.038	0.03 ± 0.10	Tkachenko et al. Tkachenko et al.
DW Car	1.328	9.68 0.07	B1_V B1_V	11.34 ± 0.12 10.63 ± 0.14	4.558 ± 0.045 4.297 ± 0.055	4.175 ± 0.008 4.198 ± 0.011	4.446 ± 0.016 4.423 ± 0.016	4.055 ± 0.063 3.915 ± 0.067	0.00 ± 0.00	Southworth & C Clausen et al. (2

http://www.astro.keele.ac.uk/jkt/debcat/

1SWASP J093010.78+533859.5
47 Tuc V69
β Aur
χ^2 Hya
η Mus
ψ Cen
ζ Phe
AD Boo
AH Cep
AI Hya
AI Phe
AP And
AQ Ser
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AY Cam
BF Dra
BG Ind
BK Peg
BW Aqr
CD Tau
CF Tau
CG Cyg
CM Dra
CO And
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CU Cnc
CV Boo
CV Vel
CW Cep
DI Her
DM Vir
DW Car
EE Peg
EF Aqr
EI Cep
EK Cep
EM Car
EP Cru
EW Ori
EY Cep
FL Lyr
FS Mon
FT Ori
GG Lup
GG Ori
GU Boo
GX Gem
GZ CMa
HD 71636
HP Aur
HP Dra
HS Aur
HS Hya
HW CMa
HY Vir
IM Vir
IQ Per
IT Cas
Kepler-34
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KIC 3858884
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KW Hya
KX Cnc
LL Aqr
LSPM J1112+7626
LV Her
M4 V65
M4 V66
M4 V69
M55 V54
MG1-116309
MG1-2056316
MG1-506664
MG1-646680
MG1-78457
MU Cas
MY Cyg
NGC 7142 V1
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PT Vel
PV Cas
PV Pup
QX Car
RR Lyn
RS Cha
RT CrB
RW Lac
RZ Cha
SW CMa
SZ Cen
TV Nor
TZ For
TZ Men
U Oph
UX Men
UZ Dra
V335 Ser
V364 Lac
V375 Cep
V380 Cyg
V392 Car
V396 Cas
V404 CMa
V413 Ser
V432 Aur
V442 Cyg
V451 Oph
V453 Cyg
V459 Cas
V467 Vel
V478 Cyg
V501 Her
V539 Ara
V565 Lyr
V568 Lyr
V578 Mon
V596 Pup
V624 Her
V636 Cen
V760 Sco
V785 Cep
V885 Cyg
V906 Sco
V1031 Ori
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V2365 Oph
V3903 Sgr
V4089 Sgr
VV Crv
VZ Cep
VZ Hya
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WW Aur
WW Cam
WX Cep
WZ Oph
XY Cet
Y Cyg
YY Gem
YZ Cas
ZZ UMa