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White Dwarfs are Small, Fast-Spinning Hot Stars

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Summary: In order to determine the density of white dwarfs and other stars I used a database and created several relations, such as mass/volume of different star types, to create comparable dana, the values of rotation, the percentage of the objects orbiting around a central object and the explanation how different speeds of rotation, if unused, influence the irregular derivation of the gravitational results. Some other factors, essential in creating real values in astrophysics, are also analyzed here. The results acquired in such a way reveal a real image, which is impossible to perceive if analysing only a small or limited quantity of stars and other objects. It doesn't work without a larger sequence of relations of different parameters. The research represents the interweaving of data for stars when indicators start displaying comparable results. The rotation speed value is closely related to star types, as presented in the tables 4 and 6. At the same time it defines the temperature level of an object, but only faintly affects its density. Density mildly decreases with the increase of the rotation speed, but magnetic field value increases strongly.

Keywords: White Dwarfs, Hot Stars, Rotation Speed, Density

1. Introduction

The article analyses several parameters, included in several relations, based on which real data representing white dwarfs could be created, in the terms of their real density and some other factors that ascribe white dwarfs into that type of the celestial objects.
Star types are related to the speed of rotation around an object, in the relation with temperature. The influence of rotation is on the magnetic field value, on the percentage of objects in the orbit and on the orbital speeds. Tables 3, 7, 8 and 9 show that objects with the same mass can be classified into groups of many star types. If the effects of the star rotation are ruled out, then a proper answer for such an outcome is not possible to find, because a similar quantity of mass has to produce similar values.
There are more than 270 links in 14 tables, leading towards the database, in which a reader can check the source of information (reference). The goal of this is not to dispute or to support the mainstream points of view, but to introduce real data checking, which is available these days in the form of the official scientific measuring. The topic on matter is not limited to white dwarfs, but it rather analyzes all star types and the centers of galaxies.

2. Determining the density of white dwarfs and "normal" stars

2.1. Determining the density of white dwarfs and "normal" hot stars

I use the existing databases in providing evidence to support or dispute the existence of extreme densities of stars and other objects. All evidence are related to the source of information through one or several steps. [1]

The method to acquire reliable data is to create a sequence of relations from the official measuring results, carried out and obtained on the same place and without the possibility to manipulate the results. The selection of evidence to be analyzed is as it is, because generally there are no cumulative data (temperature, mass, radius, luminosity, etc.) for a large number of objects which are used for relation sequences, in order to analyze matter from all angles.
A part of the evidence are here on purpose, to be relevant and comparable inside the relations. The data from the relations are intended to cover the whole diapason of values: mass, radius, temperature, etc. A single object of a certain type is never an object of analysis, not even in a single case. If based on particular cases, the conclusions tend to be opposite to the real situation.

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Table 1. The observation of the parallel indicators of mass, radius, temperature and surface gravity

Star	Volume	Mass, Sun=1	Radius, Sun=1	Mass/volume	Type of star
V391 Pegasi	0,02865	0,5±0,05	0,23±0,03	17,45	blue-white subdwarf star
HD_49798	7,1795	1,5	1,45	0,2089282	sdO6p
NSVS 14256825	0,016153	0,528	*0,19*	32,687	sdOB / M V
2MASS J19383260+4603591	0,026 / 0,0093	0,48 / 0,120	0,223 / 0,158	18,46 / 12,9	sdBV/M
HVS 7	150,72	3,7	4,0	0,02455	sdB
Kepler-70	0,0197	0,496	0,203	25,178	sdB
PG 1047+003	0,07948	0,5	0,15	62,91	sdBe
Groombridge 1830	0,744	0,661	0,681	0,8884	class G8 subdwarf
Kapteyn's Star	0,058	0,274	0,291	4,7241	sdM1
HD 134439	0,4431	~0,78	0,573	1,76	sd:K1Fe-1
HD 134440	0,3596	~0,73	0,5345	2,03	sdK2.5
Sun (M=1, R=1)	2,355	1	1	**0,4246..**	**G2V**
WR 102	0,33113184	16,7	0,52	50,433	WR- WO2
WR 93b	0,20061	8,1	0,44	40,377	WR_ WO3
WR 142	1,2058	28,6	0,8	23,72	WR- WO2
WR 7	4,711	13	1,26	2,76	WR-WN4-s
WR 46	5,924	14	1,36	2,2633	WR- WN3p-w
WR 3	35,921	15	2,48	0,4176	WR-WN3-hw
WR 21a	4069,44	103,6	12	0,02546	WR-WN5ha
WR 31a	62.231,76	17	29,8	0,0002732	WR-WN11h
Lambda Cephei	17.462,0	51	18-21	0,00292	O6.5If(n)p
NML Cygni	3'898'927.371,9	50	1.183,0	0,000000013	M4.5-M7.9Ia-III
Ros 47	0,01157	0,35	0,17	30,1724	M4.0Vn
Kepler-42	0,01157	0,13	0,17	11,236	M5V
YZ Canis Minoris	0,0801	0,308	0,324	3,845	M5V
LHS 1140	0,015154	0,146	0,186	9,63442	M4.5V
SU Ursae Majoris	0,01097	0,105	0,167	9,572	dwarf nova
OTS 44	0,129	0,011	0,23-0,57	0,08527	r. planet/ Brown Dwarf
TVLM 513-46546	0,0031345	0,09	0,11	28,7127	Red/Brown Dwarf-M9
DEN 0255−4700	0,001716795	0,025-0,065	0,08-0,1	26,212	Brown Dwarf-L8/L9
OGLE-TR-123	0,00517395	0,085	0,13	16,4285	Brown Dwarf-M

Mass and radius of Jupiter (Jup = 1), density: Sun=1,408 g/cm^3; Jupiter 1,326 g/cm^3

Star	Volume	Mass $_{Jup}$	Radius $_{Jup}$	Mass/volume	Type of star
Teide 1	127,1939	57 ± 15	3,78	0,445	Brown Dwarf-M8
Cha 110913-773444	13,73436	8 (+7, -3), (*17*)	1,8	0,5825	r. planet/ Brown Dwarf
PSO J318.5-22 12	8,4346	6,5	1,53	0,771	rogue planet
2MASS J0523−1403	2,42636	67,54	1,01	27,84	Brown Dwarf-L2.5V
EBLM J0555-57 Ab	1,396	85,2 (~0,081 Sun)	0,84	61,03	Brown Dwarf
2MASS 0939−2448	1,20576	20-50 (35)	0,8	29,0273	Brown Dwarf-T8
15 Sagittae	2,350	68,7	1	29,172	Brown Dwarf-L4
LHS 6343 c	1,13051	62,1	0,783	54,931	Brown Dwarf-T

Star	Distance AU	Mass $_{Jup}$	Radius $_{Jup}$	Temperature K	Type planet
Srars generate their own energy. Planet reflected radiation, do not create their own energy.					
2MASS J2126-8140	6.900,0	13,3	/	1.800,0	Planet
ROXs 42B b	140	9	0,9-3	1.800,0-2.600,0	Planet
HIP 65426 b	92	9	1,5	1.450,0	Planet
HR 8799 d	24	7	1,2	1.090,0	Planet; density 4 kg m^3
HR 8799 c	38	7	1,3	1.090,0	Planet; density 3,2 kg m^3
DH Tau B	330	*11*	*2,7*	2.750,0	Planet
UScoCTIO 108 b	670	14	0,9078	2.350,0	Planet
11 Oph b	472,9	21	0,9078	2.375,0	Planet

Table 1. Relationshift: Mass/volume, temperature and surface gravity

The analysis of the objects' density in Table 1 (in the relation of mass/volume – star type) points out that there is no consistency that would be related to star types. Inside a same star type there are densities, which are lower, higher or the same as the one of Sun. The old concept's contours are clearly visible in the statements that smaller stars have higher densities and big red stars are inflated objects. [2] However, that concept also lacks consistency. It is particularly important to point out that the mass and radius estimates of the objects that are smaller than the mass and radius of Sun are generally only hypothesized (using the old hypotheses). [3] If a star has the same mass or radius as Sun, the estimate of its density may follow several different hypotheses. For example, if an object is classified into a type of "planets", it is less dense than a type known as a brown dwarf. Brown Dwarfs masses are 0,035 and 68,7 (*2MASS 0939−2448* and *15 Sagittae*) and it makes mass/volume ratio of 29,0273 and 29,1720 respectively. At the same time, planets with the distances of 38-6.900,0 AU have mass/volume ratio around 1 (*ROXs 42B b* ø 0,6036; *11 Oph b* 11,8765). In a particular type of stars, Wolf–Rayet stars, there are stars with mass/volume ratio of 0,0002732 (*WR 31a*) to 50,4330 (*WR 102*). M type stars with large quantities of mass suggest their densities are low, because the effects of their slow rotation don't provide the same results with the objects they are interacted with, to the contrary of faster and fast rotating stars. Generally, the decrease of density is ascribed to the stars with the increase of mass above 1 M Sun (*Lambda Cephei* M 51 M_{Sun}, M/V 0,00292, T 36.000°K; *NML Cygni* M 51 M_{Sun}, M/V 0,000000013, T 2.500-3.250°K).

Table 2. Density/temperature

Depth km Earth (Sun)	Component layer	Density g/cm^3	Temperature K
0–35	Crust	2,2–2,9	-86 to 200 (400)
35–2.890	Mantle	3,4–5,6	200-4.000
5.100–6.378	Inner core	12,8–13,1	5.400-5.700 (6.000)
>520.000,0 Sun	Sun core	150	15,7 million

Table 2. Depth km /Density/temperature

The temperature and density increases with depth. White dwarf temperatures do not follow this basic law. Their recommended density of 31.000,0 to above 460.000,0 (1'000.000-1'500.000) g/cm^3 would generate temperatures above 100 billion K. Temperatures white dwarfs are from under 10.000 (4.270 ± 70 *Gliese 223.2*; *G 240-72* 5.590,0± 90°K) to 200.000°K; (*H1504 + 65*, 200.000°K; 310.000 °K *PSR B0943 + 10*) [6] like normal hot stars.

Table 3. Small stars/ temperature and type of star

Small star	Mass $_{Sun=1}$	Temper. K	Type
Beta Pictoris b	0,0086-0,012	1.724,0	Exoplanet, dist. *11,8 AU*
ROXs 42Bb	0,0086	1.800-2.600	Exoplanet, dist. *140 AU*
CW Leonis	0,7-0,9	2.000,0	C9,5e
LP Andromedae	0,8	2.100-3.350	C8,3.5e
Kelu-1	0,060	2.020	brown dwarfs L2
Gliese 570	0,55	2.700	M1V
HIP 78530 b	0,022	2.800	exoplanet; dist. *710 AU*
Lacaillea 9352	0,503	3.692	M0.5V
WD 0346+246	0,77	3.800	**white dwarf**
Castor C	0,5992	3.820	BY Draconis dwarf stars
HIP 12961	0,63	3.838,0	red dwarf M0V
LP 658-2	0,45 (0,80)	4.270 (5.180)	**white dwarf DZ11.8**
HR 9038 Ab	0,67	4.620,0	red dwarf K3V
Groombridge 1830	0,661	4.759	G8 subdwarf
AC Herculis	0,6	5.225	F2pIb
Mu Cassiopeiae	0,74	5.341	G5Vb
L 97-12	0,59	5.700,0	**white dwarf DC8.8**
QX Andromedae sec	0,45	6.420	F6
S Arae	0,51	6.563	A3 II
HR 4049	0,56	7.500	B9.5Ib-II
GD 356	0,67	7.510	**white dwarf DC7**
Zeta Cygni B	0,6	12.000	**white dwarf DA4.2**
40 Eridani B	0,573	16.500	**white dwarf DA4**
Kepler-70	0,496	27.730	sdB
V391 Pegasi	0,5	29.300,0	blue-white subdwarf star
2MASS J19383260+4603591	0,48	29.564	sdBV/M
PG 0112+104	0,52 ± 0,05	>30.000	**white dwarf**
PG 1047+003	~0,5	33.500	sdBe
LS IV-14 116	*0,485*	34.950	sdB0.5VIIHe18
HD 149382	0,29−0,53	35.000,0	B5 VI
NSVS 14256825	0,528	42.000,0	sdOB / M V

Table 3. Small stars, mass ~0,5 MSun (except 3 exoplanets and *Kelu-1*) in relation to temperature and type of stars

We see here that part of the white dwarfs is not separated from other star types in terms of temperature. The same mass of small stars does not give the same temperature. White dwarfs have low (4.270,0 (5.180) *HIP 12961*) and high temperatures (*PG 0112+104* >30.000). The height of these temperatures covers the spectral type stars from K to O.

2.1. White Dwarfs vs. other types of stars with an emphasis on the speed of rotation

Now, let's determine which basic forces give stars different values of temperature, luminosity, the relation of mass/radius and the value of surface gravity.

Table 4. The relation (of the section of main star types) of rotation, mass, radius, temperature and type

Star	Speed rotation		Maas Sun=1	Radius Sun=1	Temperature K	Type
White Dwarf						
GD 356	115	minutes	0,67	/	7.510,0	white dwarf
EX Hydrae	67	minutes	0,55 ± 0,15	/	/	white dwarf
AR Scorpii A	1,95	minutes	0,81 – 1,29	/	/	white dwarf pulsar
V455 Andromedae	67,62	second	0,6	/	/	white dwarf
RX Andromedae	200	km/s	0,8	/	40.000-45.000,0	white dwarf
RX J0648.0-4418	13,2	second	1,28	/	/	white dwarf
Pulsar						
PSR J0348+0432	39,123	m. second	2,01 ± 0,04	13 ± 2 km	/	pulsar
Vela X-1	283	second	1,88	~11,2	31.500,0	X-ray pulsar, B-type
Cen X-3	4,84	second	20,5 ± 0,7	12	39.000	X-ray pulsar
PSR B0943 + 10	1,1	second	0,02	2,6 km	310.000,0	pulsar
PSR 1257 + 12	6,22	m. second	1,4	10 km	28.856	pulsar
Wolf–Rayet stars						
HD 5980 B	<400	km/s	66	22	45.000	WN4
WR 2	500	km/s	16	0,89	141.000	WN2-w
WR 142	1.000,0	km/s	28,6	0,80	200.000	WO2
R136a2	200	km/s	195	23,4	53.000	WN5h
Normal hot stars						
VFTS 102	600±100	km/s	~25	/	36.000±5.000	O9:Vnnne
BV Centauri	500±100	km/s	1,18	/	40.000±1.000	G5-G8IV-V
Gamma Cassiopeiae	*432*	km/s	14,5	8,8	25.000	B0.5IVe
LQ Andromedae	300	km/s	8,0	3,4	40.000-44.000	O4If(n)p
Zeta Puppis	220	km/s	22,5 – 56,6	14 - 26	40.000-44.000	O4If(n)p
LH54-425 O5	250	km/s	28	8,1	45.000	O5V
Melnick 42	240	km/s	189	21,1	47.300	O2If
BI 253	200	km/s	84	10,7	50.100	O2V-III(n)((f*))
Red Dwarf						
Gliese 876	96,6	days	0,37	0,3761	3.129±19	M4V
Kepler-42	2,9±0,4	km/s	0,13±0.05	0,17±0.04	3.068±174	M5V
Kapteyn's star	9,15	km/s	0,274	0,291±0.025	3.550±50	sdM1
Wolf 359	<3,0	km/s	0,09	0,16	2.800±100	M6.5 Ve
Normal cool stars						
HD 220074	3,0	km/s	1,2 ± 0.3	49.7 ± 9.5	3.935 ± 110	M2III
V Hydrae	11 - 14	km/s	1,0	420 - 430	2.650	C6,3e
β Pegasi	9,7	km/s	2,1	95	3.689	M2.5II–IIIe
Betelgeuse	5	km/s	11,6	887 ±203	3.590	M1–M2 Ia–ab
F Type Star						
Beta Virginis	4,3	km/s	1,25	1.681 ± 0.008	6.132±26	F9 V
pi3 Orionis	17	km/s	1,236	1,323	6.516±19	F6 V
4 Equulei	6,2±1,0	km/s	1,39	~1,2	6.213±63	F8 V
6 Andromedae	18	km/s	1,30	1,50	6.425±218	F5 V

Table 4. The relation (of the section of main star types) of rotation, mass, radius, temperature and type

A column "Speed rotation" points to very fast rotations of white dwarfs [4], [5], pulsars, Wolf–Rayet stars and O, B type stars.

Small hot stars make a rotation in a very short period (from miliseconds to a few minutes). Large hot stars rotate at the speed of above 400 km/s (*Gamma Cassiopeiae*). White dwarfs with a diameter of ~80 km makes a rotation generally in a few seconds (*RX J0648.0-4418* 13 seconds). [6]

Wolf–Rayet stars are very fast-rotating stars, the speeds of which can be up to 1.000 km/s, which is generally accompanied by very high temperatures (*WR 142* 200.000°K, 1.000,0 km/s).

With the decrease of the rotational speed there is also the decrease of a star's temperature. Here it needs to be mentioned that

Quote: Temperature and radiance are also affected by the tidal forces from the bigger or smaller binary effect, environment, the density of gas (layers) between the observer and a star, the speed of outer matter influx to the object, especially into a whirl or cyclone on the poles of a star (over 140 tons of space matter is falling daily to the surface of Earth [16]), different sums of the mass and rotation effects to the small and big stars. [7] end quote

Large (medium and small) red stars have the rotation from +0 to above 10 km/s and temperatures of 1.800 to above 4.000°K (*S Cassiopeiae* 1.800,0; *W Aquilae* 1.800; *V Hya* 2.160; *II Lup* 2.000; *V Cyg* 1.875; *LL Peg* 2.000; LP And 2.040; V384 Per 1.820; S Aur 1.940; QZ Mus 2.200; AFGL 4202 2.200: V821 Her 2.200; V1417 Aql 2.000; S Cep 2.095; etc.). [8]

A smaller star needs higher speed to achieve temperatures similar to those of large stars and the reason for it is that a larger object has more matter, which by friction and different speeds of rotation of different layers, creates higher temperatures.

Table 5. The relation white dwarfs / other star types within the relation: temperature / age of stars

Star	Temperature K	Age Gyr	Type of stars
Gliese 876	3.129,0 ± 19	0,1-9,9	M4V
LHS 1140	3.131 ± 100	>5	M4.5V
Kapteyn's star	3.550±50	~11	sdM1
WD 0346+246	3.800 ± 100	11-12	**white dwarf**
Castor C	3.820	370 Myr	dM1e
G 240-72	5.590 ± 90	5,69	**white dwarf** DQP9.0
G 99-47	5.790 ± 110	3,97	**white dwarf** DAP8.9
V382 Carinae	5.866	6,8	G0-4-Ia
LSPM J0207+3331	6.120,0	3	**white dwarf**
Beta Virginis	6.132 ± 26	2,9 ± 0.3	F9 V
pi3 Orionis	6.516 ± 19	1,4	F6 V
4 Equulei	6.213±63	3,07	F8 V
6 Andromedae	6.425±218	2,91	F5 V
GD 356	7.510,0	2,1	**white dwarf**
Ross 640	8.100	1,2	**white dwarf** DZA5.5
Denebola	8.500	100–380 Myr	A3Va
LP 145-141	8.500 ± 300	1,44	**white dwarf** DQ6
Gliese 318	9.120,0	550 Myr	**white dwarf** DA5.5
HD 21389	9.730	11	A0Iae
WD 0806−661	10.205 ± 390	0,62	**white dwarf** DQ4.2
ε Reticuli B	15.310 ± 350	1,5	**white dwarf**
η Aurigae	17.201	22-55 Myr	B3V
GD 61	17.280	200 Myr	**white dwarf** DA
Sirius B	25.000 ± 200	228 Myr	**white dwarf** DA2
LQ Andromedae	40.000-44.000	3,4 Myr	O4If(n)p
Zeta Puppis	40.000	3,2 Myr	O4If(n)p
LH54-425 O5	45.000	2,0 Myr	O5V
Melnick 42	47.300,0	~1 Myr	O2If

Table 5. The relation white dwarfs / other star types within the relation: temperature / age of stars

By reviewing the relation white dwarfs / other star types within the relation: temperature / age of stars does not find separation of white dwarfs from other stars. White dwarfs are found within the range of K to O star type, in terms of the height temperature and the recommended age of stars. The temperature is directly related to the speed of rotation (with the exclusion of binary systems effects ...). this is shown in Table 4.

Table 6. The relation temperature K / rotation speed

Star	Temperature K	Rotation speed km/s
Slowly-rotating stars		
Betelgeuse	3.590,0	5
Andromeda 8	3.616±22	5±1
β Pegasi	3.689	9,7
Aldebaran	3.910	634 day
HD 220074	3.935	3
Beta Ursae Minoris	4.030	8
Arcturus	4.286	2,4±1,0
Hamal	4.480	3,44
Iota Draconis	4.545	1,5
Pollux	4.666	2,8
ζ Cyg A	4.910	0,4 ± 0,5
Capella	4.970	4,1
The stars with fast and very fast rotations		
Alpha Pegasi	9.765,0	125

Eta Ursae Majoris	16.823	150
η Aurigae	17.201	95
Spica secondary	20.900±800	199
Gamma Cassiopeiae	25.000	432
S Monocerotis	38.500	120
RX Andromedae (WD)	40.000,0	200
Zeta Puppis	40.000-44.000	220
HD 93129	42.500	130
LH54-425 O5	45.000	250
LH54-425 O3	45.000	197
HD 5980 B	45.000	400
Melnick 42	47.300	240
BI 253	50.100	200
HD 269810	52.500	173
WR 2	141.000	500
WR 142	200.000,0	1.000

Table 6. The relation: temperature / rotation speed

This table draws a sharp line between fast and slow rotating stars.

Quote: A star's speed of rotation causes its temperature (its temperature only partially depends on the mass of a star), its radius (ratio: the mass of a star / the radius of a star; Sun = 1), surface gravity and the color of a star. The stars with a slow rotation are "cold" stars (with the exclusion of binary systems effects), independently of the mass of a star and its radius. Their color is red and they are dominant in Universe

(M type of stars, 0,08–0,45 masses of Sun; ≤ 0.7 R of Sun; 2.400–3.700°K; 76,45% of the total number of stars in Milky Way (*Harvard spectral classification*);

all red stars above 0,45 M of Sun are also included here, as well as the largest red (and other) stars in our galaxy). The stars with fast and very fast rotations are mostly present in nebulae, i.e., in the space which is rich with matter. Their total quantity in Milky Way makes 3,85% (O class ~0,00003%). [10] end of quote

2.2. Similar mass of stars it's situated in different classes (type) and different temperatures

Table 4. can be presented in such a way to create a relation: approximately the same mass/temperature and relate it to a star type. The relation has to show the same results for the same quantity of mass. It is unacceptable to claim that a single quantity of mass abides by several laws of nature or has several states, which would provide different results. The conditions should be almost identical or we are to explain, why a single quantity of mass has different laws of manifestation. The same goes for the claims that stars realize nuclear fission and fusion on the different levels, because there is one and the same quantity of mass on the same place.

Tabele 7. Star type / mass / temperature

	Star	Type	Mass Sun=1	Temperature °K
1	*EZ Canis Majoris*	WN3-hv	19	89.100
2	*Centaurus X-3*	O	20,5 ± 0,7	39.000
3	*η Canis Majores*	B	19,19	15.000
4	*HD 21389*	A	19,3	9.730
5	*Kappa Pavonis*	F	19 - 25	5.250 – 6.350
6	*V382 Carinae*	G	20	5.866
7	*S Persei*	M	20	3.000-3.600
8	*DH Tauri b*	Planet; *dist. 330 AU*	12 M Jupiter	2.750
9	*HIP 78530 b*	Planet; dist. 740 AU	24 M Jup.	2.700 (2.800)

Table 7. Stars, similar mass (except No 8, 9,), different classes (type) and temperatures. [7]

It is obvious from the table that the relation of the same mass, different temperatures and the other star type can be met only by the evidence from the table 4 and 6. [7] , [10] The decrease of the rotational speed (with other incoming factors taken into consideration).

This is no exception, but rather a rule, that a majority of the diapason of the star mass, from the smallest to the largest, the stars belong to different types for any quantity of mass.

Table 8. Star type mass ~17/temperature

	Star	Type	Mass Sun=1	Temperature °K
1.	*WR 2,*	WN4-s	16	141.000
2.	*μ Columbae*	O	16	33.000
3.	*Deneb*	A	19	8.525
3.	*Gamma Cassiopeiae*	B	17	25.000
4.	*VY Canis Majoris*	M	17	3.490

5.	*DH Tauri b*	Planet; dist. 330 AU	12 M Jupiter	2.750
6.	*HIP 78530 b*	Planet; dist. 710 AU	24 M Jup.	2.700 (2.800)
7.	*NML Cygni*	M	50	3.834

Table 8. Star type / mass ~17/temperature [10]

Table 9. Star type/mass ~2/temperature and radius

Star	Type	Mass (Sun = 1)	Temperature K	Radius (Sun=1)
S Pegasi	M5e - M8.5e	1,4-1,8	2.107	459-574
R Leporis	C7,6e(N6e)	2,5 – 5	2.245-2.290	400±90
Rho Orionis	K0 III	2,67	4.533	25
29_Orionis	G8IIIFe-0.5	2,33	4.852	10,36
BX_Andromedae	F2V	2,148	6.650	2,01
Mu_Orionis	Aa	2,28	8.300	2,85
3_Centauri	B8V	2,47	9.638	2,8
Vela X-1	B0.5Ib pulsar	1,88	31.500	~11,2
HD_49798	sdO5.5	1,50	47.500	1,45
PSR J0348+0432	pulsar	2,01	/	13±2 km
14 Aurigae	white dwarf	1,64	7.498	/
GQ Lupi b	planet	1-36 MJup.	2.650 ± 100	Distance 100 AU

Table 9. Star type /mass ~2/temperature and radius

The result of the two Sun masses is taken to exclude the discussions of the existence of different types of combustion that are created due to different star formations. [3] This is particularly expressed by the planet display, with temperatures of 2.650 ± 100, which is a star with an independent process of creating warmth and radiation. This is stressed in the table 4, with planets which temperatures are ~2.700°K and their mass being from 12-24 masses of Jupiter, and the star *NML Cygni* with its mass of 50 MSun and the temperature of 3.834°K.

2.3. Bodies in distant orbits can be stars – planets

Table 10. Bodies with mass to 13 mass of Jupiter/temperature and distance

Planet and Brown dwarf	Mass of Jup.	Temperature°K	Distance AU
HD 106906 b	11±2	1.800	120
1RXS 1609 b	8 (14)	1.800	330
Cha 110913-773444	8 (+7; -3)	1.300 -1.400	
OTS 44	11,5	1.700 - 2.300	
GQ Lupi b	1 - 36	2.650 ± 100	100
ROXs 42Bb	9	1.950 ± 100	157
HD 44627	13 - 14	1.600 -2.400	275
DH Tauri b	12	2.750	330
2M1207b	4 (+6; -1)	1.600±100	40
2M 044144	9,8±1,8	1.800	15 ± 0.6
2MASS J2126-8140	13,3 (± 1,7)	1.800	6.900
HR 8799 c	7 (+3; -2)	1.090 (+10; -90)	~38
HR 8799 d	7 (+3; -2)	1.090 (+10; -90)	~24
HIP 65426 b	9,0 ±3,0	1.450.0 (± 150.0)	92

Table 10. Bodies with mass to 13 mass of Jupiter/temperature and distance

Table 10. eliminates the claims that objects below 13 masses of Jupiter can't have an independent production of high temperatures, which is measured also on stars *S Cassiopeiae* 1.800*; W Aquilae* 1.800; V Cyg 1.875; V384 Per 1.820; S Aur 1.940°K. [8]

2.4. Observing the density of bodies in our system

Table 11. Rotation/density

Body	Rotation		Mean density g/cm^3	Mass Jupiter=1	Magnetic field G	Type
Sun	25,38	day	1,408	1047	1-2 (10–100 sunspots)	G2V
Jupiter	9,925	hours	1,326	1	4,2 (10–14 poles)	planets
Saturn	10,64	hours	0,687	0,299	0,2	planets
Uranus	(−)0,718 33	day	1,27	0,046	0,1	planets
Neptune	0,6713	day	1,638	0,054	0,14	Planets
Sirius A	16	km/s	0,568	2,063±0,023 M_{Sun}	weak	A0mA1 Va
PSR J1745-2900	3,76	second	/	1-3 (mass Sun)	10^{14}	pulsar

Table 11. Rotation/density

Here I will give an additional explanation for a claim that "A small star with a high mass will have a high density, because all of its mass is getting squeezed into a small space…hence, it's very dense. A larger star of the same mass will have a lower density due to its stuff not getting squeezed so much."[11] through the rotation of an object around its axis.

Jupiter has the fastest rotation in our system, but it doesn't affect the density of the planet – it is lower [4] than the one of Sun, Neptune and Pluto. Saturn is particularly interesting with its lowest density in the table 11. (*Pan* 0,42 g/cm^3, *Atlas* 0,46 g/cm^3, *Pandora* 0,48 g/cm^3, *Prometheus* 0,48±0,09 g/cm³ *67P/Ch-G* 0,533 g/cm^3, *Amalthea* 0,857±0,099 g/cm^3 are solid bodies).

This states that density doesn't change with the increase of mass, temperature and the speed of rotation. The speed of rotation in our system is significant with the objects that are inside the area, rich with matter, i.e., the area, where disks of gas and asteroid belts are created. The higher the frequency of matter incoming onto an object generally means that the discussed object will have a faster rotation and higher temperature.
Fast-rotating hot stars are generally situated in those parts of the space, which is rich with matter (nebulae).

Table 12. ~ % Mass of satellites Satellites /Central body

Body	~ % Mass of satellites Satellites /Central body	Mean density kg/m3
Pluto	12,2	*1750*
Earth	1,23	5515
Neptune	0,385	1638
Sun	0,14	1408
Saturn	0,024	687
Jupiter	0,021	1326
Uranus	0,00677	1270

Table 12. ~ % Mass of satellites Satellites /Central body

If only the influence of gravity on the objects in an orbit or in the correlation of two stars is exclusively measured, that would be a wrong thing to do and it is presented in table 12. Pluto is the smallest object and it has the biggest percentage of its satellites' mass in the relation an object's mass/its satellites' mass in the orbit.
The stars with a fast rotation create impressive systems, independently of their mass or radius, to the opposite of the stars with a slow rotation.

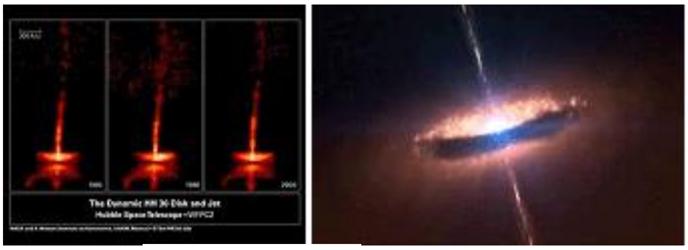

Figure 1. a fast rotating object

2.5. The band of matter concentration and the influence of rotational speed on bodies in orbits and centers of galaxies
In the formula for determining the behavior of planets, must be included temperatures of space and proximity to the central body, with special observation of the belt that is richer in matter.

Confirmation of this correctness it's easy to see that the satellites of *Jupiter*, *Uranus*, *Neptun*e.. are in the zone where matter is concentrated. Their mass is significantly larger than other satellites.

It is obligatory to observe here reducing the distance of that belt, with shrinking temperatures of space as the planets move away from the central body, independent of the mass of the central body and the speed of rotation, though mass and the speed of rotation is and here very important.

Table 13. Orbital periods days, distance, mass

Exoplanets	Mass Jup.	orbital periods days	Distance AU	*BD + 20 2457 c* =1 orbital periods days
BD + 20 2457 c	12,47	621,99	2,01	1
HD 213240 b	4,5	951	2,03	+329,01
OGLE-2006-BLG-109Lb	0,73	1.788,5	2,3	+1.166,51
Gliese 317 b	2,5	692	1,5	+70,01
HD 95089 b	1,2	507	1,51	-114,99
HD 183263 b	3,67	626,5	1,51	+4,5
HD 143361 b	3,48	1.046,2	1,98	+424,21
HD 5319 b	1,76	641	1,6697	+19,01
V391 Pegasi b	3,2	1.170	1,7	+548,01

Table 13. Orbital periods days, distance, mass; BD + 20 2457 c =1

Table 13. shows that similar or identical distance of planets from their central object doesn't result with the same orbital period. This data is seriously undermining the idea of the uniformed reduction of the gravitational influence on the objects in our system and it shows that the speed of the objects in the orbit depends on mass as well as on the rotational speed of the central object and the mass of the objects in the orbit.

All these principles mentioned above are the same for the galactical centers, which are the largest objects in the Universe.

Table 14. galaxies, relationship: type galaxies / rotational speed of galaxies

Galaxies	Type galaxies	Speed of galaxies
Fast-rotating galaxies		
RX J1131-1231	quasar	„X-ray observations of RX J1131-1231 (RX J1131 for short) show it is whizzing around at almost half the speed of light. [22] [23]
Spindle galaxy	elliptical galaxy	„possess a significant amount of rotation around the major axis"
NGC 6109	Lenticular Galaxy	Within the knot, the rotation measure is 40 ± 8 rad m−2 [24]
Contrary to: Slow Rotation		
Andromeda Galaxy	spiral galaxy	maximum value of 225 kilometers per second
UGC 12591	spiral galaxy	the highest known rotational speed of about 500 km/s,
Milky Way	spiral galaxy	210 ± 10 (220 kilometers per second Sun)

Table 14. galaxies, relationship: type galaxies / rotational speed of galaxies; No 1-3 Fast-rotating galaxies, No 4-6 Slow-rotating galaxies. From [10]

3. Conclusion

When there is an increase of data quantity in the database, the preconditions are created to discuss the white dwarfs within realistic values as small, fast-rotating stars with the density, which is similar to other, both medium and large, hot stars. Small fast-rotating stars (white dwarfs, pulsars, neutron stars, Wolf–Rayet stars, proto stars) have gas disks or significant asteroid belts, because they are formed inside the space, rich with matter. [7]
Very fast rotation of the central body creates fast orbits of gas, small and large objects.

With the constant increase of matter [9], a star gathers it from the orbits (including the process of migration of hydrogen and helium from the smaller objects towards a star [12]) and, because of growth, disks and asteroid belts are growing smaller, accordingly to the relation of: a star's mass/the mass of matter in its orbit.
Due to high temperatures of the fast-rotating stars, matter disintegrates into hydrogen (some helium is the product of the process of constant joining of particles). The traces of complex elements on hot objects are detected because there is a constant daily influx of matter, within which there are complex elements and compounds.

The speed of rotation with the increase of an object's mass affects more the level of temperature, because more quantity of mass gives an object a more complex structure, higher values of matter mixture and the creation of higher forces of pressure and friction. A higher value of particle work and a higher quantity of work, due to rotation, binary effects,... make the difference between cold and hot stars. When binary effects, made by the activity of gravity (the attraction force of matter), are ruled out, the rotation speed of an object determines the speeds of gas orbits and objects, with the remark that every object has an area in which matter is concentrated. Masses of the objects in that area are larger than masses of the objects in the orbit and therefore gas, dust and asteroids (disks and asteroid areas) are concentrated in such areas. [13], [14], [15], [16]

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