MEASUREMENTS, UNITS, DIMENSIONS

NUMVAL2.WPD

June 23, 2008

S.I. NUMERICAL VALUES

$\log_{10}$(m,kg,s) values

FUNDAMENTAL CONSTANTS:

NEWTON'S CONSTANT	G =	−10.175 295 619	$[L^3/MT^2]$
PLANCK'S CONSTANT	$\hbar$ =	−33.976 923 930	$[ML^2/T]$
VELOCITY OF LIGHT	c =	8.476 820 703	[L/T]
PROTON MASS/ELECTRON MASS	μ =	3.263 908 788	[0]
FINE STRUCTURE CONSTANT	α =	−2.136 834 673	[0]
COULOMB/GRAVITY FORCE RATIO	S =	39.355 471 115	[0]
	$\alpha\mu$ =	1.127 074 115	[0]

PLANCK VALUES:

PLANCK MASS	$m_o = \sqrt{c\hbar/G}$	=	−7.662 403 804	[M]	
PLANCK LENGTH	$l_o = \sqrt{G\hbar/c^3}$	=	−34.791 340 829	[L]	
PLANCK TIME	$t_o = \sqrt{G\hbar/c^5}$	=	−43.268 161 532	[T]	
	c/G	=	18.652 116 322	$[MT/L^2]$	
SCHWARTZSCHILD BOUND	c^2/G	=	27.128 937 025	[M/L]	m_o/l_o
TIME FACTOR	c^3/G	=	35.605 757 728	[M/T]	
PLANCK FORCE	c^4/G	=	44.082 578 431	$[ML/T^2]$	
PLANCK POWER	c^5/G	=	52.559 399 134	$[ML^2/T^3]$	
PLANCK ENERGY	$\sqrt{\hbar c^5/G}$	=	9.291 237 602	$[ML^2/T^2]$	
"	$\sqrt{\hbar c^5/G}$	=	$m_oc^2 = Gm_o^2/l_o = \hbar/t_o$	$[ML^2/T^2]$	
PLANCK DENSITY	$c^5/\hbar G^2$	=	96.711 618 683	$[M/L^3]$	
[PLANCK CHARGE]^2	$\hbar c$	=	−25.500 103 227	$[ML^3/T^2]$	
$m_o \cdot l_o$	$\hbar/c$	=	−42.453 744 633	[ML]	
$m_o \cdot t_o$	$\hbar/c^2$	=	−50.930 565 336	[MT]	

BARYON VALUES:

PROTON MASS	m_p	=	−26.776 602 304	[M]	
NEUTRON MASS	m_n	=	−26.776 004 075	[M]	
ELECTRON MASS	m_e	=	−30.040 511 092	[M]	
ELECTRON RADIUS	r_e	=	−14.550 068 214	[L]	
ELECTRON FREQUENCY	c/r_e	=	+23.026 888 917	[1/T]	
[ELECTRON CHARGE]^2	$\hbar\alpha c$	=	−27.636 937 900	$[ML^3/T^2]$	e^2

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June 23, 2008

S.I. NUMERICAL VALUES

$\log_{10}$(m,kg,s) values

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FINE STRUCTURE CONSTANT	α =	−2.136 834 673	[0]
COULOMB/GRAVITY FORCE RATIO	S =	39.355 471 115	[0]
	$\alpha\mu$ =	1.127 074 115	[0]

PLANCK VALUES:

PLANCK MASS	$m_o = \sqrt{c\hbar/G}$	=	−7.662 403 804	[M]	
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PLANCK TIME	$t_o = \sqrt{G\hbar/c^5}$	=	−43.268 161 532	[T]	
	c/G	=	18.652 116 322	$[MT/L^2]$	
SCHWARTZSCHILD BOUND	c^2/G	=	27.128 937 025	[M/L]	m_o/l_o
TIME FACTOR	c^3/G	=	35.605 757 728	[M/T]	
PLANCK FORCE	c^4/G	=	44.082 578 431	$[ML/T^2]$	
PLANCK POWER	c^5/G	=	52.559 399 134	$[ML^2/T^3]$	
PLANCK ENERGY	$\sqrt{\hbar c^5/G}$	=	9.291 237 602	$[ML^2/T^2]$	
"	$\sqrt{\hbar c^5/G}$	=	$m_oc^2 = Gm_o^2/l_o = \hbar/t_o$	$[ML^2/T^2]$	
PLANCK DENSITY	$c^5/\hbar G^2$	=	96.711 618 683	$[M/L^3]$	
[PLANCK CHARGE]^2	$\hbar c$	=	−25.500 103 227	$[ML^3/T^2]$	
$m_o \cdot l_o$	$\hbar/c$	=	−42.453 744 633	[ML]	
$m_o \cdot t_o$	$\hbar/c^2$	=	−50.930 565 336	[MT]	

BARYON VALUES:

PROTON MASS	m_p	=	−26.776 602 304	[M]	
NEUTRON MASS	m_n	=	−26.776 004 075	[M]	
ELECTRON MASS	m_e	=	−30.040 511 092	[M]	
ELECTRON RADIUS	r_e	=	−14.550 068 214	[L]	
ELECTRON FREQUENCY	c/r_e	=	+23.026 888 917	[1/T]	
[ELECTRON CHARGE]^2	$\hbar\alpha c$	=	−27.636 937 900	$[ML^3/T^2]$	e^2

POWERS AND ROOTS:

c	8.476 820 703	l_o	–34.791 340 829	r_e	–14.550 068 214
	16.953 641 406	l_o^2	-69.582 681 658	r_e^2	-29.100 136 428
	25.430 462 109	l_o^3	-104.374 022 487	r_e^3	-43.650 204 642
	33.907 282 812	l_o^4	-139.165 363 316	r_e^4	-58.200 272 856
	42.384 103 515	l_o^5	-173.956 704 145	r_e^5	-72.750 341 07
	50.860 924 218	l_o^6	-208.748 044 974	r_e^6	-87.300 409 284
	59.337 744 921	l_o^7	-243.539 385 803	r_e^7	-101.850 477 498
	67.814 565 624	l_o^8	-278.330 726 632	r_e^8	-116.400 545 712
	76.291 386 327	l_o^9	-313.122 067 461	r_e^9	-130.950 613 926
	84.768 207 03	l_o^{10}	-347.913 408 29	r_e^{10}	-145.500 682 14

TEMPLATE VALUES

$S^{1/2}$	=	19.677 735 557		$(\alpha\mu)^{1/2}$	=	0.563 537 057
S	=	39.355 471 115	= $\alpha^{-23}\mu^{-3}$	$(\alpha\mu)$	=	1.127 074 115
$S^{3/2}$	=	59.033 206 671		$(\alpha\mu)^{3/2}$	=	1.690 611 171
S^2	=	78.710 942 230	= $\alpha^{-46}\mu^{-6}$	$(\alpha\mu)^2$	=	2.254 148 230
$S^{5/2}$	=	98.388 677 785		$(\alpha\mu)^{5/2}$	=	2.817 685 288
S^3	=	118.066 413 342	= $\alpha^{-69}\mu^{-9}$	$(\alpha\mu)^3$	=	3.381 222 342
$S^{7/2}$	=	137.744 148 899		$(\alpha\mu)^{7/2}$	=	3.944 759 403
S^4	=	157.421 884 456	= $\alpha^{-92}\mu^{-12}$	$(\alpha\mu)^4$	=	4.508 296 460
$S^{9/2}$	=	177.099 620 013		$(\alpha\mu)^{9/2}$	=	5.071 833 518
S^5	=	196.777 355 570	= $\alpha^{-115}\mu^{-15}$	$(\alpha\mu)^5$	=	5.635 370 575
$S^{11/2}$	=	216.455 091 127		$(\alpha\mu)^{11/2}$	=	6.198 907 633
S^6	=	236.132 826 684	= $\alpha^{-138}\mu^{-18}$	$(\alpha\mu)^6$	=	6.762 444 690
$S^{13/2}$	=	255.810 562 241		$(\alpha\mu)^{13/2}$	=	7.325 981 741
S^7	=	275.488 297 798	= $\alpha^{-161}\mu^{-21}$	$(\alpha\mu)^7$	=	7.889 518 798
$S^{15/2}$	=	295.166 033 355		$(\alpha\mu)^{15/2}$	=	8.453 055 855
S^8	=	314.843 768 912	= $\alpha^{-184}\mu^{-24}$	$(\alpha\mu)^8$	=	9.016 592 912

$(S/\alpha\mu)^{1/4}$	= 9.557 099 250	= $\alpha^{-6}\mu^{-1}$		$(\alpha\mu S)^{1/4}$	= 10.120 636 308	= $\alpha^{-11/2}\mu^{-1/2}$	
$(S/\alpha\mu)^{1/2}$	= 19.114 198 500	= $\alpha^{-12}\mu^{-2}$		$(\alpha\mu S)^{1/2}$	= 20.241 272 615	= $\alpha^{-11}\mu^{-1}$	
$(S/\alpha\mu)$	= 38.228 397 000	= $\alpha^{-24}\mu^{-4}$		$(\alpha\mu S)$	= 40.482 545 230	= $\alpha^{-22}\mu^{-2}$	
$(S/\alpha\mu)^{3/2}$	= 57.342 595 500	= $\alpha^{-36}\mu^{-6}$		$(\alpha\mu S)^{3/2}$	= 60.723 817 845	= $\alpha^{-33}\mu^{-3}$	
$(S/\alpha\mu)^{2}$	= 76.456 794 000	= $\alpha^{-48}\mu^{-8}$		$(\alpha\mu S)^{2}$	= 80.965 090 460	= $\alpha^{-44}\mu^{-4}$	
$(S/\alpha\mu)^{5/2}$	= 95.570 992 500	= $\alpha^{-60}\mu^{-10}$		$(\alpha\mu S)^{5/2}$	= 101.206 363 075	= $\alpha^{-55}\mu^{-5}$	
$(S/\alpha\mu)^{3}$	= 114.685 191 000	= $\alpha^{-72}\mu^{-12}$		$(\alpha\mu S)^{3}$	= 121.447 635 690	= $\alpha^{-66}\mu^{-6}$	
$(S/\alpha\mu)^{7/2}$	= 133.799 389 500	= $\alpha^{-84}\mu^{-14}$		$(\alpha\mu S)^{7/2}$	= 141.688 908 305	= $\alpha^{-77}\mu^{-7}$	
$(S/\alpha\mu)^{4}$	= 152.913 588 000	= $\alpha^{-96}\mu^{-16}$		$(\alpha\mu S)^{4}$	= 161.930 180 920	= $\alpha^{-88}\mu^{-8}$	
$(S/\alpha\mu)^{9/2}$	= 172.027 786 500	= $\alpha^{-108}\mu^{-18}$		$(\alpha\mu S)^{9/2}$	= 182.171 453 535	= $\alpha^{-99}\mu^{-9}$	
$(S/\alpha\mu)^{5}$	= 191.141 985 000	= $\alpha^{-120}\mu^{-20}$		$(\alpha\mu S)^{5}$	= 202.412 726 15	= $\alpha^{-110}\mu^{-10}$	
$(S/\alpha\mu)^{11/2}$	= 210.256 183 500	= $\alpha^{-132}\mu^{-22}$		$(\alpha\mu S)^{11/2}$	= 222.653 998 765	= $\alpha^{-121}\mu^{-11}$	
$(S/\alpha\mu)^{6}$	= 229.370 382 000	= $\alpha^{-144}\mu^{-24}$		$(\alpha\mu S)^{6}$	= 242.895 271 38	= $\alpha^{-132}\mu^{-12}$	

$\alpha^{1/2}$	= −1.068 417 336	$\mu^{1/2}$	= 1.631 954 394	$(\alpha/\mu)^{1/2}$	= −2.700 371 731
α	= −2.136 834 673	μ	= 3.263 908 788	(α/μ)	= −5.400 743 462
$\alpha^{3/2}$	= −3.205 252 008	$\mu^{3/2}$	= 4.895 863 182	$(\alpha/\mu)^{3/2}$	= −8.101 115 193
α^{2}	= −4.273 669 346	μ^{2}	= 6.527 817 576	$(\alpha/\mu)^{2}$	= −10.801 486 924
$\alpha^{5/2}$	= −5.342 086 680	$\mu^{5/2}$	= 8.159 771 970	$(\alpha/\mu)^{5/2}$	= −13.501 858655
α^{3}	= −6.410 504 016	μ^{3}	= 9.791 726 364	$(\alpha/\mu)^{3}$	= −16.202 230 386
$\alpha^{7/2}$	= −7.478 921 352	$\mu^{7/2}$	= 11.423 680 758	$(\alpha/\mu)^{7/2}$	= −18.902 602 117
α^{4}	= −8.547 338 688	μ^{4}	= 13.055 635 152	$(\alpha/\mu)^{4}$	= −21.602 973 848
$\alpha^{9/2}$	= −9.615 756 024	$\mu^{9/2}$	= 14.687 589 546	$(\alpha/\mu)^{9/2}$	= −24.303 345 579
α^{5}	= −10.684 173 36	μ^{5}	= 16.319 543 940	$(\alpha/\mu)^{5}$	= −27.003 717 310
$\alpha^{11/2}$	= −11.752 590 696	$\mu^{11/2}$	= 17.951 498 334	$(\alpha/\mu)^{11/2}$	= −29.704 089 041
α^{6}	= −12.821 008 032	μ^{6}	= 19.583 452 728	$(\alpha/\mu)^{6}$	= −32.404 460 772
$\alpha^{13/2}$	= −13.889 425 368	$\mu^{13/2}$	= 21.215 407 122	$(\alpha/\mu)^{13/2}$	= −35.104 832 503
α^{7}	= −14.957 842 704	μ^{7}	= 22.847 361 516	$(\alpha/\mu)^{7}$	= −37.805 204 234
$\alpha^{15/2}$	= −16.026 260 004	$\mu^{15/2}$	= 24.479 315 910	$(\alpha/\mu)^{15/2}$	= −40.505 575 965
α^{8}	= −17.094 677 376	μ^{8}	= 26.111 270 304	$(\alpha/\mu)^{8}$	= −43.205 947 696

NOTES:

fermi	r_e	= −14.550 068 214	$\hbar\alpha/m_ec$	[L]
compton wave length	λ_c	= −12.413 233 541	$\hbar/m_ec$	[L]
bohr radius	a_o	= −10.276 398 868	$\hbar/m_ec\alpha$	[L]
rydberg *	r_∞^{-1}	= −8.139 564 195	$\hbar/m_ec\alpha^2$	[L]

Each of the above lengths differ by α.

*The Rydberg constant $R_\infty = m_ec\,\alpha^2/4\pi\hbar$ = 5.040 354 331 [L^{-1}].
The above quantity $r_\infty^{-1} = \hbar/m_ec\alpha^2$. (i.e.no 4π) [L]

ALTERNATE REPRESENTATIONS FOR DIMENSIONALITIES

~~DIMENSION~~ NAME	SYMBO L	PLANCK	$\log_{10}$(cgs)	$\alpha^u\ \mu^v$	$\alpha^X\ \mu^Y\ S^Z$
LENGTH	L	$\sqrt{(G\hbar/c^3)}$	–32.791341	α^1	
TIME	T	$\sqrt{(G\hbar/c^5)}$	–43.268161	$\alpha^{12}\ \mu^2$	$(\alpha\mu)^{1/2}\ S^{-1/2}$
MASS	M	$\sqrt{(c\hbar/G)}$	–4.662404	μ^1	
G	L^3/MT^2	G	–7.175296	$\alpha^{-21}\ \mu^{-5}$	$\alpha^2\ \mu^{-2}\ S$
VELOCITY	L/T	c	10.476821	$\alpha^{-11}\ \mu^{-2}$	$\alpha^{1/2}\ \mu^{-1/2}\ S^{1/2}$
FREQUENCY	1/T	$\sqrt{(c^5/G\hbar)}$	43.268161	$\alpha^{-12}\ \mu^{-2}$	$(\alpha\mu)^{-1/2}\ S^{1/2}$
ACCELERATION Ω^{-1}	L/T^2	$\sqrt{(c^7/G\hbar)}$	53.744983	$\alpha^{-23}\ \mu^{-4}$	$\mu^{-1}\ S$
MOMENTUM	ML/T	$\sqrt{(c^3\hbar/G)}$	5.814417	$\alpha^{-11}\ \mu^{-1}$	$(\alpha\mu S)^{1/2}$
AREA	L^2	$G\hbar/c^3$	–65.582382	α^2	
VOLUME	L^3	$(G\hbar/c^3)^{3/2}$	–98.373723	α^3	
DENSITY	M/L^3	$c^5/G^2\hbar$	93.711319	$\alpha^{-3}\ \mu$	
ACTION	ML^2/T	$\hbar$	–26.976924	$\alpha^{-10}\ \mu^{-1}$	$\alpha^{3/2}\ \mu^{1/2}\ S^{1/2}$
FORCE	ML/T^2	c^4/G	49.082578	$\alpha^{-23}\ \mu^{-3}$	S
ENERGY $I^2\ \Omega$	ML^2/T^2	$\sqrt{(c^5\hbar/G)}$	16.291238	$\alpha^{-22}\ \mu^{-3}$	$\alpha\ S$
POWER $I\sqrt{F}$	ML^2/T^3	c^5/G	59.559399	$\alpha^{-34}\ \mu^{-5}$	$\alpha^{1/2}\ \mu^{-1/2}\ S^{3/2}$
PRESSURE	M/LT^2	$c^7/G^2\hbar$	114.664960	$\alpha^{-25}\ \mu^{-3}$	$\alpha^{-2}\ S$
[CHARGE] ^{2} e^2	ML^3/T^2	$\hbar c$	–16.500103	$\alpha^{-21}\ \mu^{-3}$	$\alpha^2\ S$
CHARGE e	$\sqrt{(ML^3/T^2)}$	$\sqrt{(\hbar c)}$	–8.250052	$\alpha^{-21/2}\ \mu^{-3/2}$	$\alpha\ S^{1/2}$
CURRENT I	$\sqrt{(ML^3/T^4)}$	$c^3/\sqrt{G}$	35.018110	$\alpha^{-45/2}\ \mu^{-7/2}$	$\alpha^{1/2}\ \mu^{-1/2}\ S$
VOLTAGE $\sqrt{F}$	$\sqrt{(ML/T^2)}$	$c^2/\sqrt{G}$	24.541289	$\alpha^{-23/2}\ \mu^{-3/2}$	$S^{1/2}$
RESISTANCE Ω	T^2/L	$\sqrt{(G\hbar/c^7)}$	–53.744983	$\alpha^{23}\ \mu^4$	$\mu\ S^{-1}$
e^2/c^2	ML	$\hbar/c$	–37.453745	$\alpha\ \mu$	
$I\ \Omega = e/c$	$\sqrt{(ML)}$	$\sqrt{(\hbar/c)}$	–18.726873	$\alpha^{1/2}\ \mu^{1/2}$	
	M/L	c^2/G	28.128937	$\alpha^{-1}\ \mu$	
	M/T	c^3/G	38.605758	$\alpha^{-1/2}\ \mu^{1/2}\ S^{1/2}$	

SCALE VS. DIMENSIONALITY

TABLE Ia

[Values given in $\log_{10}$(cgs) units]

LEVEL	LENGTH=L	TIME =L/c	MASS	VOLUME	M/L	M ·L
units	centimeters	seconds	grams	centimeters^3	gr/cm	gr ·cm
DARK MTR.	–53.032 612	–63.509 434	14.451796	–159.097 836	67.484 408	–38.580 816
Planck c G ħ	$(G\hbar/c^3)^{1/2}$	$(G\hbar/c^5)^{1/2}$	$(c\hbar/G)^{1/2}$	$(G\hbar/c^3)^{3/2}$	c^2/G	$\hbar/c$
Planck number	–32.791 340	–43.268 161	–4.662 403	–98.374 020	28.128 937	–37.453 745
BARYON	–12.550 068	–23.026 889	–23.776 602	–37.650 204	–11.226 534	–36.326 670
STAR	7.691 205	–2.785 617	33.565 995	23.073 614	25.874 790	41.257 200
UNIVERSE	27.932 478	17.455 657	52.680 194	83.797 432	24.747 716	80.612 672

TABLE Ib

[Values given in $\log_{10}$(cgs) units]

LEVEL	ENERGY =Mc^2	POWER	FORCE	GRAVITY	DENSITY	M ·V
units	ergs	ergs/sec	dynes	dynes	gr/cm^3	gr ·cm^3
DARK MTR.	35.405 440	98.914 874	88.438 046	127.793 520	173.549 632	–144.646 040
Planck c G ħ	$(\hbar c^5/G)^{1/2}$	c^5/G	c^4/G	c^4/G	$c^5/\hbar G^2$	$\hbar^2/c^4G$
Planck number	16.291 237	59.559 399	49.082 578	49.082 578	93.711 617	–103.036 423
BARYON	–2.822 960	20.203 929	9.727 108	10.854 182	13.873 602	–61.426 806
STAR	54.519 639	57.305 256	46.828 434	44.574 284	10.492 381	56.639 609
UNIVERSE	73.633 836	56.178 179	45.701 358	42.320 136	–31.117 238	136.477 626

TABLE IIa

Values are [$\log_{10}$(cgs)LEVEL –$\log_{10}$(cgs)PLANCK]

LEVEL	LENGTH=L	TIME=L/c	MASS	VOLUME	M/L	M ·L
DARK MTR.	–20.241 272	–20.241 272	19.114 199	–60.723 818	39.355 471	–1.127 074
PLANCK	1	1	1	1	1	1
BARYON	20.241 272	20.241 272	–19.114 199	60.723 818	–39.355 471	1.127 074
STAR	40.482 544	40.482 544	38.228 398	121.447 636	2..254 148	78.710 942
UNIVERSE	60.723 816	60.723 816	57.342 597	182.171 454	3.381 222	118.066 413

TABLE IIb

Values are [$\log_{10}$(cgs)LEVEL –$\log_{10}$(cgs)PLANCK]

LEVEL	ENERGY=Mc^2	POWER	FORCE	GRAVITY	DENSITY	M ·V
DARK MTR.	19.114197	39.355 471	39.355468	78.710942	79.838 015	–41.609 617
PLANCK	1	1	1	1	1	1
BARYON	–19.114 199	–39.355 471	–39.355 471	–38.228 396	–79.838 015	41.609 617
STAR	38.228 520	–2.254 025	–2.254 085	–4.508412	–83.219 236	159.676 032
UNIVERSE	57.342 719	.–3.381 222	–3.381 222	–6.762538	–124.828 855	239.514 049

TABLE IIIa

[Values are in α, μ, S unit with planck values taken = 1]

LEVEL	LENGTH=L	TIME=L/c	MASS	VOLUME	M/L	M ·L
DARK MTR.	$(\alpha\mu S)^{-1/2}$	$(\alpha\mu S)^{-1/2}$	$(S/\alpha\mu)^{1/2}$	$(\alpha\mu S)^{-3/2}$	S	$(\alpha\mu)^{-1}$
PLANCK	1	1	1	1	1	1
BARYON	$(\alpha\mu S)^{1/2}$	$(\alpha\mu S)^{1/2}$	$(S/\alpha\mu)^{-1/2}$	$(\alpha\mu S)^{3/2}$	S^{-1}	$(\alpha\mu)$
STAR	$(\alpha\mu S)$	$(\alpha\mu S)$	$(S/\alpha\mu)$	$(\alpha\mu S)^{3}$	$(\alpha\mu)^{2}$	S^{2}
UNIVERSE	$(\alpha\mu S)^{3/2}$	$(\alpha\mu S)^{3/2}$	$(S/\alpha\mu)^{3/2}$	$(\alpha\mu S)^{9/2}$	$(\alpha\mu)^{3}$	S^{3}
DIMENSION	α	$\alpha^{12}\,\mu^{2}$	μ	α^{3}	$\alpha^{-1}\,\mu$	$\alpha\,\mu$

TABLE IIIb

[Values are in α, μ, S unit with planck values taken = 1]

LEVEL	ENERGY=Mc^2	POWER	FORCE	GRAVITY	DENSITY	M ·V
DARK MTR.	$(S/\alpha\mu)^{1/2}$	S	S	S^{2}	$(\alpha\mu)\,S^{2}$	$(\alpha\mu)^{-2}\,S^{-1}$
PLANCK	1	1	1	1	1	1
BARYON	$(S/\alpha\mu)^{-1/2}$	S^{-1}	S^{-1}	$(S/\alpha\mu)^{-1}$	$(\alpha\mu)^{-1}\,S^{-2}$	$(\alpha\mu)^{2}\,S$
STAR	$(S/\alpha\mu)$	$(\alpha\mu)^{-2}$	$(\alpha\mu)^{-2}$	$(\alpha\mu)^{-4}$	$(\alpha\mu)^{-4}\,S^{-2}$	$(\alpha\mu)^{2}\,S^{4}$
UNIVERSE	$(S/\alpha\mu)^{3/2}$	$(\alpha\mu)^{-3}$	$(\alpha\mu)^{-3}$	$(\alpha\mu)^{-6}$	$(\alpha\mu)^{-6}\,S^{-3}$	$(\alpha\mu)^{3}\,S^{6}$
DIMENSION	α S	$\alpha^{-11}\,\mu^{-2}$ S	S	S	$\alpha^{-3}\,\mu$	$\alpha^{3}\,\mu$

TABLE IVa

[Values are in α, μ, units with planck values taken = 1]

LEVEL	LENGTH=L	TIME=L/c	MASS	VOLUME	M/L	M ·L
DARK MTR.	$\alpha^{11}\,\mu^{1}$	$\alpha^{11}\,\mu^{1}$	$\alpha^{-12}\,\mu^{-2}$	$\alpha^{33}\,\mu^{3}$	$\alpha^{-23}\,\mu^{-3}$	$\alpha^{-1}\,\mu^{-1}$
PLANCK	$\alpha^{0}\,\mu^{0}$	$\alpha^{0}\,\mu^{0}$	$\alpha^{0}\,\mu^{0}$	$\alpha^{0}\,\mu^{0}$	$\alpha^{0}\,\mu^{0}$	$\alpha^{0}\,\mu^{0}$
BARYON	$\alpha^{-11}\,\mu^{-1}$	$\alpha^{-11}\,\mu^{-1}$	$\alpha^{12}\,\mu^{2}$	$\alpha^{-33}\,\mu^{-3}$	$\alpha^{23}\,\mu^{3}$	$\alpha^{1}\,\mu^{1}$
STAR	$\alpha^{-22}\,\mu^{-2}$	$\alpha^{-22}\,\mu^{-2}$	$\alpha^{-24}\,\mu^{-4}$	$\alpha^{-66}\,\mu^{-6}$	$\alpha^{2}\,\mu^{2}$	$\alpha^{-46}\,\mu^{-6}$
UNIVERSE	$\alpha^{-33}\,\mu^{-3}$	$\alpha^{-33}\,\mu^{-3}$	$\alpha^{-36}\,\mu^{-6}$	$\alpha^{-99}\,\mu^{-9}$	$\alpha^{3}\,\mu^{3}$	$\alpha^{-69}\,\mu^{-9}$
DIMENSION	α	$\alpha^{12}\,\mu^{2}$	μ	α^{3}	$\alpha^{-1}\,\mu$	$\alpha\,\mu$

TABLE IVb

[Values are in α, μ, units with planck values taken = 1]

LEVEL	ENERGY=Mc^2	POWER	FORCE	GRAVITY	DENSITY	M ·V
DARK MTR.	$\alpha^{-12}\,\mu^{-2}$	$\alpha^{-23}\,\mu^{-3}$	$\alpha^{-23}\,\mu^{-3}$	$\alpha^{-46}\,\mu^{-6}$	$\alpha^{-45}\,\mu^{-5}$	$\alpha^{21}\,\mu^{1}$
PLANCK	$\alpha^{0}\,\mu^{0}$	$\alpha^{0}\,\mu^{0}$	$\alpha^{0}\,\mu^{0}$	$\alpha^{0}\,\mu^{0}$	$\alpha^{0}\,\mu^{0}$	$\alpha^{0}\,\mu^{0}$
BARYON	$\alpha^{11}\,\mu^{1}$	$\alpha^{23}\,\mu^{3}$	$\alpha^{23}\,\mu^{3}$	$\alpha^{24}\,\mu^{4}$	$\alpha^{45}\,\mu^{5}$	$\alpha^{-21}\,\mu^{-1}$
STAR	$\alpha^{-24}\,\mu^{-4}$	$\alpha^{-2}\,\mu^{-2}$	$\alpha^{-2}\,\mu^{-2}$	$\alpha^{-4}\,\mu^{-4}$	$\alpha^{42}\,\mu^{2}$	$\alpha^{-90}\,\mu^{-10}$
UNIVERSE	$\alpha^{-36}\,\mu^{-6}$	$\alpha^{-3}\,\mu^{-3}$	$\alpha^{-3}\,\mu^{-3}$	$\alpha^{-6}\,\mu^{-6}$	$\alpha^{63}\,\mu^{3}$	$\alpha^{-135}\,\mu^{-15}$
DIMENSION	$\alpha^{-22}\,\mu^{-3}$	$\alpha^{-34}\,\mu^{-5}$	$\alpha^{-23}\,\mu^{-3}$	$\alpha^{-23}\,\mu^{-3}$	$\alpha^{-3}\,\mu$	$\alpha^{3}\,\mu$

ALTERNATE TIME TYPES

Values are in $\log_{10}$(cgs) units

LEVEL	TIME t	TIME T	TIME K	TIME Z	TIME τ	TIME η
formulae	$t = L/c$	$T = GM/c^3$	$K = \hbar/Mc^2$	$Z = G\hbar/c^4L$	$\tau = \sqrt{L^3/GM}$	$\eta = \sqrt{G^3\hbar^2M/c^{10}L^3}$
DARK MTR.	–63.509 433	–24.153 960	–62.382 361	–23.026 889	–83.187 168	–3.349 154
Planck c G ħ	$(G\hbar/c^5)^{1/2}$	$(G\hbar/c^5)^{1/2}$	$(G\hbar/c^5)^{1/2}$	$(G\hbar/c^5)^{1/2}$	$(G\hbar/c^5)^{1/2}$	$(G\hbar/c^5)^{1/2}$
Planck numer	-43.268 161	-43.268 161	-43.268 161	-43.268 161	-43.268 161	-43.268 161
BARYON	–23.026 889	–62.382 358	–24.153 963	–63.509 433	–3.349 154	–83.187 168
STAR	–2.785 617	–5.039 761	–81.496 560	–83.750 706	–1.658 543	–84.877 779
UNIVERSE	17.455 655	14.074 438	–100.610759	–103.991 979	19.146 267	–105.682 591

TABLE A $\log_{10}$ (gcs) [$E = Mc^2$]

	Time used is $t = L/c$			Time used is $T = GM/c^3$		
LEVEL	ENERGY	POWER	FORCE	ENERGY	POWER	FORCE
units	ergs	ergs/sec	dynes	ergs	ergs/sec	dynes
DARK MTR.	35.405 440	98.914 874	88.438 046	35.405 440	59.559 399	88.438 046
Planck c G ħ	$(\hbar c^5/G)^{1/2}$	c^5/G	c^4/G	$(\hbar c^5/G)^{1/2}$	c^5/G	c^4/G
Planck numer	16.291 237	59.559 399	49.082 578	16.291 237	59.559 399	49.082 578
BARYON	–2.822 960	20.203 929	9.727 108	–2.822 960	59.559 399	9.727 108
STAR	54.519 639	57.305 256	46.828 434	54.519 639	59.559 399	46.828 434
UNIVERSE	73.633 836	56.178 179	45.701 358	73.633 836	59.559 399	45.701 358

TABLE B $\log_{10}$ (gcs) [$E = Mc^2$]

	Time used is $K = \hbar/Mc^2$			Time used is $Z = G\hbar/c^4L$		
LEVEL	ENERGY	POWER	FORCE	ENERGY	POWER	FORCE
units	ergs	ergs/sec	dynes	ergs	ergs/sec	dynes
DARK MTR.	35.405 440	97.787 798	88.438 046	35.405 440	58.432 326	88.438 046
Planck c G ħ	$(\hbar c^5/G)^{1/2}$	c^5/G	c^4/G	$(\hbar c^5/G)^{1/2}$	c^5/G	c^4/G
Planck numer	16.291 237	59.559 399	49.082 578	16.291 237	59.559 399	49.082 578
BARYON	–2.822 960	21.331 002	9.727 108	–2.822 960	60.686 472	9.727 108
STAR	54.519 639	136.016 199	46.828 434	54.519 639	138.270 345	46.828 434
UNIVERSE	73.633 836	174.244 595	45.701 358	73.633 836	177.625 815	45.701 358

TABLE C $\log_{10}$ (gcs) [$E = Mc^2$]

	Time used is $\tau = \sqrt{L^3/GM}$			Time used is $\eta = \sqrt{G^3\hbar^2M/c^{10}L^3}$		
LEVEL	ENERGY	POWER	FORCE	ENERGY	POWER	FORCE
units	ergs	ergs/sec	dynes	ergs	ergs/sec	dynes
DARK MTR.	35.405 440	118.592 608	88.438 046	35.405 440	38.754 594	88.438 046
Planck c G ħ	$(\hbar c^5/G)^{1/2}$	c^5/G	c^4/G	$(\hbar c^5/G)^{1/2}$	c^5/G	c^4/G
Planck numer	16.291 237	59.559 399	49.082 578	16.291 237	59.559 399	49.082 578
BARYON	–2.822 960	0.526 194	9.727 108	–2.822 960	80.364 208	9.727 108
STAR	54.519 639	56.178 182	46.828 434	54.519 639	139.397 415	46.828 434
UNIVERSE	73.633 836	54.487 569	45.701 358	73.633 836	179.316 427	45.701 358

TABLE A $\log_{10}$ (gcs) [E = ħ/time]

	Time used is t =L/c			Time used is T = GM/c^3		
LEVEL	ENERGY	POWER	FORCE	ENERGY	POWER	FORCE
units	ergs	ergs/sec	dynes	ergs	ergs/sec	dynes
DARK MTR.	36.532 509	100.041 942	89.565 121	–2.822 964	21.330 996	50.209 648
Planck c G ħ	$(\hbar c^5/G)^{1/2}$	c^5/G	c^4/G	$(\hbar c^5/G)^{1/2}$	c^5/G	c^4/G
Planck numer	16.291 237	59.559 399	49.082 578	16.291 237	59.559 399	49.082 578
BARYON	–3.950 035	19.076 854	8.600 033	35.405 436	97.787 774	47.955 504
STAR	–24.191 307	–21.405 690	–31.882 512	–21.937 163	–16.897 402	–29.628 368
UNIVERSE	–44.432 579	–62.888 234	–72.365 057	–41.051 362	–55.125 805	–68.983 840

TABLE B $\log_{10}$ (gcs) [E = ħ/time]

	Time used is K = ħ/Mc^2			Time used is Z = G ħ/c^4L		
LEVEL	ENERGY	POWER	FORCE	ENERGY	POWER	FORCE
units	ergs	ergs/sec	dynes	ergs	ergs/sec	dynes
DARK MTR.	35.405 440	97.787 798	88.438 046	–3.950 035	19.076 854	49.082 578
Planck c G ħ	$(\hbar c^5/G)^{1/2}$	c^5/G	c^4/G	$(\hbar c^5/G)^{1/2}$	c^5/G	c^4/G
Planck numer	16.291 237	59.559 399	49.082 578	16.291 237	59.559 399	49.082 578
BARYON	–2.822 960	–21.331 002	9.727 108	36.532 509	100.041 942	49.082 578
STAR	54.519 639	136.016 196	46.828 434	56.773 782	140.524 488	49.082 578
UNIVERSE	73.633 836	174.244 594	45.701 358	77.015 035	181.007 035	49.082 578

TABLE C $\log_{10}$ (gcs) [E = ħ/time]

	Time used is $\tau = \sqrt{L^3/GM}$			Time used is $\eta = \sqrt{G^3\hbar^2M/c^{10}L^3}$		
LEVEL	ENERGY	POWER	FORCE	ENERGY	POWER	FORCE
units	ergs	ergs/sec	dynes	ergs	ergs/sec	dynes
DARK MTR.	56.210 244	139.397 412	109.242 856	–23.627 770	–20.278 616	29.404 842
Planck c G ħ	$(\hbar c^5/G)^{1/2}$	c^5/G	c^4/G	$(\hbar c^5/G)^{1/2}$	c^5/G	c^4/G
Planck numer	16.291 237	59.559 399	49.082 578	16.291 237	59.559 399	49.082 578
BARYON	–23.627 770	–20.278 617	–11.077 700	56.210 244	139.397 412	68.760 312
STAR	–25.408 381	–23.659 838	–33.009 586	57.900 855	142.778 634	50.209 650
UNIVERSE	–46.123 191	–65.269 458	–74.055 669	78.705 661	184.388 246	50.773 183

TABLE A $\log_{10}$ (gcs) [F = ML/time^2]

	Time used is t =L/c			Time used is T = GM/c^3		
LEVEL	ENERGY	POWER	FORCE	ENERGY	POWER	FORCE
units	ergs	ergs/sec	dynes	ergs	ergs/sec	dynes
DARK MTR.	35.405 440	98.914 874	88.438 046	–43.305 508	–19.151 818	9.727 104.
Planck c G ħ	$(\hbar c^5/G)^{1/2}$	c^5/G	c^4/G	$(\hbar c^5/G)^{1/2}$	c^5/G	c^4/G
Planck numer	16.291 237	59.559 399	49.082 578	16.291 237	59.559 399	49.082 578
BARYON	–2.822 960	20.203 929	9.727 108	88.438 406	150.820 944	100.988 474
STAR	54.519 639	57.305 256	46.828 434	59.027 986	56.376 542	51.336 781
UNIVERSE	73.633 836	56.178 179	45.701 358	80.396 381	66.321 943	52.463 404

) TABLE B $\log_{10}$ (gcs [F = ML/time^2]

	Time used is $K = \hbar/Mc^2$			Time used is $Z = G\hbar/c^4L$		
LEVEL	ENERGY	POWER	FORCE	ENERGY	POWER	FORCE
units	ergs	ergs/sec	dynes	ergs	ergs/sec	dynes
DARK MTR.	33.151 294	95.533 655	86.183 906	–45.559 650	–22.532 761	7.472 962
Planck c G ħ	$(\hbar c^5/G)^{1/2}$	c^5/G	c^4/G	$(\hbar c^5/G)^{1/2}$	c^5/G	c^4/G
Planck numer	16.291 237	59.559 399	49.082 578	16.291 237	59.559 399	49.082 578
BARYON	0.568 812	24.722 775	11.981 256	78.142 128	141.651 561	90.692 196
STAR	211.941 625	293.438 185	204.250 320	216.449 817	300.200 523	208.758 612
UNIVERSE	309.766 668	410.377 427	281.834 190	316.529 108	420.521 087	288.596 630

TABLE C $\log_{10}$ (gcs) [F = ML/time^2]

	Time used is $\tau = \sqrt{L^3/GM}$			Time used is $\eta = \sqrt{G^3\hbar^2M/c^{10}L^3}$		
LEVEL	ENERGY	POWER	FORCE	ENERGY	POWER	FORCE
units	ergs	ergs/sec	dynes	ergs	ergs/sec	dynes
DARK MTR.	94.760 908	177.948 076	147.793 520	–84.915 120	–81.565 966	–31.882 508
Planck c G ħ	$(\hbar c^5/G)^{1/2}$	c^5/G	c^4/G	$(\hbar c^5/G)^{1/2}$	c^5/G	c^4/G
Planck numer	16.291 237	59.559 399	49.082 578	16.291 237	59.559 399	49.082 578
BARYON	–29.627 664	–26.278 161	–17.077 596.	117.497 598	200.684 766	130.047 666
STAR	52.265 550	53.924 093	44.474 345	118.703 963	103.581 742	111.012 758
UNIVERSE	70.252 673	51.111 406	42.320 196	319.910 320	425.572 905	291.977 842

TABLE A [Log_{10}(cgs) values / log_{10} (planck) values] [$E = Mc^2$]

Time used is $t = L/c$ Time used is $T = GM/c^3$

LEVEL	ENERGY	POWER	FORCE	ENERGY	POWER	FORCE
DARK MTR.	19.114 197	39.355 471	39.355 468	19.114 197	1	39.355 468
PLANCK	1	1	1	1	1	1
BARYON	–19.114 199	–39.355 471	–39.355 471	–19.114 199	1	–39.355 471
STAR	38.228 520	–2.254 025	–2.254 085	38.228 520	1	–2.254 085
UNIVERSE	57.342 719	.–3.381 222	–3.381 222	57.342 719	1	–3.381 222

TABLE B [Log_{10}(cgs) values / log_{10} (planck) values] [$E = Mc^2$]

Time used is $K = \hbar/Mc^2$ Time used is $Z = G\hbar/c^4L$

LEVEL	ENERGY	POWER	FORCE	ENERGY	POWER	FORCE
DARK MTR.	19.114197	38.228 400	39.355 468	19.114 197	–1.127 074	39.355 468
PLANCK	1	1	1	1	1	1
BARYON	–19.114 199	–38.228 400	–39.355 471	–19.114 199	1.127 074	–39.355 471
STAR	38.228 520	76.456 800	–2.254 085	38.228 520	78.710 946	–2.254 085
UNIVERSE	57.342 719	114.685 146	–3.381 222	57.342 719	118.066 416	–3.381 222

TABLE C [Log_{10}(cgs) values / log_{10} (planck) values] [$E = Mc^2$]
Time used is $\tau = \sqrt{L^3/Gm}$ Time used is $\eta = \sqrt{G^3 \hbar^2 M/c^{10} L^3}$

LEVEL	ENERGY	POWER	FORCE	ENERGY	POWER	FORCE
DARK MTR.	19.114 197	59.033 209	39.355 468	19.114197	–20.804 805	39.355 468
PLANCK	1		1	1	1	1
BARYON	–19.114 199	–59.033 209	–39.355 471	–19.114 199	20.804 805	–39.355 471
STAR	38.228 520	–3.381 217	–2.254 085	38.228 520	79.838 016	–2.254 085
UNIVERSE	57.342 719	–5.071 830	–3.381 222	57.342 719	119.757 028	–3.381 222

TABLE A [Log_{10}(cgs) values / log_{10} (planck) values] [$E = \hbar/time$]
Time used is $t = L/c$ Time used is $T = GM/c^3$

LEVEL	ENERGY	POWER	FORCE	ENERGY	POWER	FORCE
DARK MTR.	20.241 272	40.482 543	40.482 543	–19.114 201	–38.228 403	1.127 074
PLANCK	1	1	1	1	1	1
BARYON	–20.241 272	–40.482 543	–40.482 543	–19.114 199	38.228 375	–1.127 074
STAR	–40.482 543	–80.965 089	–80.965 089	–38.228 400	–76.456 801	–78.710 946
UNIVERSE	–60.723 816	–121.447 633	–121.447 635	–57.342 599	–114.685 264	–118.066 418

TABLE B [Log_{10}(cgs) values / log_{10} (planck) values] [E = ħ/time]

Time used is K = $ħ/Mc^2$ Time used is Z = $G ħ/c^4L$

LEVEL	ENERGY	POWER	FORCE	ENERGY	POWER	FORCE
DARK MTR.	19.114 203	38.228 399	39.355 468	–20.241 272	–40.482 545	1
PLANCK	1	1	1	1	1	1
BARYON	–19.114 203	--38.228 399	39.355 468	20.241 272	40.482 545	1
STAR	38.228 399	76.456 866	2.254 144	40.482 545	80.965 089	1
UNIVERSE	57.342 599	114.685 195	3.381 220	60.724 798	121.447 63	1

TABLE C [Log_{10}(cgs) values / log_{10} (planck) values] [E = ħ/time]

Time used is $\tau = \sqrt{L^3/Gm}$ Time used is $\eta = \sqrt{G^3 ħ^2 M/c^{10} L^3}$

LEVEL	ENERGY	POWER	FORCE	ENERGY	POWER	FORCE
DARK MTR.	39.919 008	79.838 016	60.160 278	–39.919 008	–79.838 016	–19.677 736
PLANCK	1	1	1	1	1	1
BARYON	–39.919 008	–79.838 016	–60.160 278	39.919 008	79.838 016	19.677 736
STAR	–41.609 618	–83.219 238	82.092 164	41.609 618	83.219 238	1.127 072
UNIVERSE	–62.414 428	–124.828 957	123.138 247	62.414 428	124.828 957	1.690 605

$(\alpha\mu)$

TABLE A [Log_{10}(cgs) values / log_{10} (planck) values $\Rightarrow \alpha,\mu,S$] [$E = Mc^2$]

	Time used is $t = L/c$			Time used is $T = GM/c^3$		
LEVEL	ENERGY	POWER	FORCE	ENERGY	POWER	FORCE
DARK MTR.	$S^{1/2}(\alpha\mu)^{-1/2}$	S	S	$S^{1/2}(\alpha\mu)^{-1/2}$	1	S
PLANCK	1	1	1	1	1	1
BARYON	$S^{-1/2}(\alpha\mu)^{1/2}$	S^{-1}	S^{-1}	$S^{-1/2}(\alpha\mu)^{1/2}$	1	S^{-1}
STAR	$S(\alpha\mu)^{-1}$	$(\alpha\mu)^{-2}$	$(\alpha\mu)^{-2}$	$S(\alpha\mu)^{-1}$	1	$(\alpha\mu)^{-2}$
UNIVERSE	$S^{3/2}(\alpha\mu)^{-3/2}$	$(\alpha\mu)^{-3}$	$(\alpha\mu)^{-3}$	$S^{3/2}(\alpha\mu)^{-3/2}$	1	$(\alpha\mu)^{-3}$

TABLE B [Log_{10}(cgs) values / log_{10} (planck) values $\Rightarrow \alpha,\mu,S$] [$E = Mc^2$]

	Time used is $K = \hbar/Mc^2$			Time used is $Z = G\hbar/c^4L$		
LEVEL	ENERGY	POWER	FORCE	ENERGY	POWER	FORCE
DARK MTR.	$S^{1/2}(\alpha\mu)^{-1/2}$	$S(\alpha\mu)^{-1}$	S	$S^{1/2}(\alpha\mu)^{-1/2}$	$(\alpha\mu)^{-1}$	S
PLANCK	1	1	1	1	1	1
BARYON	$S^{-1/2}(\alpha\mu)^{1/2}$	$S^{-1}(\alpha\mu)$	S^{-1}	$S^{-1/2}(\alpha\mu)^{1/2}$	$(\alpha\mu)$	S^{-1}
STAR	$S(\alpha\mu)^{-1}$	$S^2(\alpha\mu)^{-2}$	$(\alpha\mu)^{-2}$	$S(\alpha\mu)^{-1}$	S^2	$(\alpha\mu)^{-2}$
UNIVERSE	$S^{3/2}(\alpha\mu)^{-3/2}$	$S^3(\alpha\mu)^{-3}$	$(\alpha\mu)^{-3}$	$S^{3/2}(\alpha\mu)^{-3/2}$	S^3	$(\alpha\mu)^{-3}$

TABLE C [Log_{10}(cgs) values / log_{10} (planck) values ⇒ α,μ,S] [$E = Mc^2$]

	Time used is $\tau = \sqrt{L^3/Gm}$			Time used is $\eta = \sqrt{G^3 \hbar^2 M/c^{10} L^3}$		
LEVEL	ENERGY	POWER	FORCE	ENERGY	POWER	FORCE
DARK MTR.	$S^{1/2} (\alpha\mu)^{-1/2}$	$S^{3/2}$	S	$S^{1/2} (\alpha\mu)^{-1/2}$	$S^{-1/2} (\alpha\mu)^{-1}$	S
PLANCK	1	1	1	1	1	1
BARYON	$S^{-1/2} (\alpha\mu)^{1/2}$	$S^{-3/2}$	S^{-1}	$S^{-1/2} (\alpha\mu)^{1/2}$	$S^{1/2} (\alpha\mu)$	S^{-1}
STAR	$S (\alpha\mu)^{-1}$	$(\alpha\mu)^{-3}$	$(\alpha\mu)^{-2}$	$S (\alpha\mu)^{-1}$	$S^2 (\alpha\mu)$	$(\alpha\mu)^{-2}$
UNIVERSE	$S^{3/2} (\alpha\mu)^{-3/2}$	$(\alpha\mu)^{-9/2}$	$(\alpha\mu)^{-3}$	$S^{3/2} (\alpha\mu)^{-3/2}$	$S^3 \alpha\mu)^{3/2}$	$(\alpha\mu)^{-3}$

TABLE A [Log_{10}(cgs) values / log_{10} (planck) values ⇒ α,μ,S] [$E = \hbar/time$]

	Time used is $t = L/c$			Time used is $T = GM/c^3$		
LEVEL	ENERGY	POWER	FORCE	ENERGY	POWER	FORCE
DARK MTR.	$S^{1/2} (\alpha\mu)^{1/2}$	$S (\alpha\mu)$	$S (\alpha\mu)$	$S^{-1/2} (\alpha\mu)^{1/2}$	$S^{-1} (\alpha\mu)$	$(\alpha\mu)$
PLANCK	1	1	1	1	1	1
BARYON	$S^{-1/2} (\alpha\mu)^{-1/2}$	$S^{-1} (\alpha\mu)^{-1}$	$S^{-1} (\alpha\mu)^{-1}$	$S^{-1/2} (\alpha\mu)^{1/2}$	$S (\alpha\mu)^{-1}$	$(\alpha\mu)^{-1}$
STAR	$S^{-1} (\alpha\mu)^{-1}$	$S^{-2} (\alpha\mu)^{-2}$	$S^{-2} (\alpha\mu)^{-2}$	$S^{-1} (\alpha\mu)$	$S^{-2} (\alpha\mu)^2$	S^{-2}
UNIVERSE	$S^{-3/2} (\alpha\mu)^{-3/2}$	$S^{-3} (\alpha\mu)^{-3}$	$S^{-3} (\alpha\mu)^{-3}$	$S^{-3/2} (\alpha\mu)^{3/2}$	$S^{-3} (\alpha\mu)^3$	S^{-3}

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TABLE B [Log_{10}(cgs) values / log_{10} (planck) values ⇒ α,μ,S] [E = ħ/time]

	Time used is K = ħ/Mc²			Time used is Z = G ħ/c⁴L		
LEVEL	ENERGY	POWER	FORCE	ENERGY	POWER	FORCE
DARK MTR.	$S^{1/2}(\alpha\mu)^{-1/2}$	$S(\alpha\mu)^{-1}$	$S(\alpha\mu)^{-1}$	$S^{-1/2}(\alpha\mu)^{-1/2}$	$S^{-1}(\alpha\mu)^{-1}$	1
PLANCK	1	1	1	1	1	1
BARYON	$S^{-1/2}(\alpha\mu)^{1/2}$	$S^{-1}(\alpha\mu)$	$S(\alpha\mu)^{-1}$	$S^{1/2}(\alpha\mu)^{1/2}$	$S(\alpha\mu)$	1
STAR	$S(\alpha\mu)^{-1}$	$S^2(\alpha\mu)^{-2}$	$(\alpha\mu)^2$	$S(\alpha\mu)$	$S^2(\alpha\mu)^2$ OR	1
UNIVERSE	$S^{3/2}(\alpha\mu)^{-3/2}$	$S^3(\alpha\mu)^{-3}$	$(\alpha\mu)^3$	$S^{3/2}(\alpha\mu)^{3/2}$	$S^3(\alpha\mu)^3$	1

typo here

TABLE C [Log_{10}(cgs) values / log_{10} (planck) values ⇒ α,μ,S] [E = ħ/time]

	Time used is τ = $\sqrt{L^3/Gm}$			Time used is η = $\sqrt{G^3\hbar^2M/c^{10}L^3}$		
LEVEL	ENERGY	POWER	FORCE	ENERGY	POWER	FORCE
DARK MTR.	$S^{1/2}(\alpha\mu)^{1/2}$	$S^2(\alpha\mu)$	$S^{3/2}(\alpha\mu)$	$S^{-1}(\alpha\mu)^{-1/2}$	$S^{-2}(\alpha\mu)^{-1}$	$S^{-1/2}$
PLANCK	1	1	1	1	1	1
BARYON	$S^{-1}(\alpha\mu)^{-1/2}$	$S^{-2}(\alpha\mu)^{-1}$	$S^{-3/2}(\alpha\mu)^{-1}$	$S(\alpha\mu)^{1/2}$	$S^2(\alpha\mu)$	$S^{1/2}$
STAR	$S^{-1}(\alpha\mu)^{-2}$	$S^{-2}(\alpha\mu)^{-4}$	$S^2(\alpha\mu)^3$	$S(\alpha\mu)^2$	$S^2(\alpha\mu)^4$	$(\alpha\mu)$
UNIVERSE	$S^{-3/2}(\alpha\mu)^{-3}$	$S^{-3}(\alpha\mu)^{-6}$	$S^3(\alpha\mu)^{-9/2}$	$S^{3/2}(\alpha\mu)^3$	$S^3(\alpha\mu)^6$	$(\alpha\mu)$

3 Basic Energies

Mass based $E = Mc^2$

TIME based $E = \frac{\hbar}{T}$

SPACE based $E = F \cdot L = \frac{c^4}{G} \cdot L$

SIX ALTERNATIVE TIME TYPES

Values are in $\log_{10}$(cgs) seconds

LEVEL	TIME t	TIME T	TIME K	TIME Z	TIME τ	TIME η
Formulae	$t = L/c$	$T = GM/c^3$	$K = \hbar/Mc^2$	$Z = G\hbar/c^4L$	$\tau = \sqrt{L^3/GM}$	$\eta = \sqrt{G^3\hbar^2M/c^{10}L^3}$
At all levels	$t = t_o^2/Z$	$T = t_o^2/K$	$K = t_o^2/T$	$Z = t_o^2/t$	$\tau = t_o^2/\eta$	$\eta = t_o^2/\tau$
DARK MTR.	–63.509 433	–24.153 960	–62.382 361	–23.026 889	–83.187 168	–3.349 154
DARK/PLNK	–20.241 273	19.114 199	–19.114 199	20.241 273	–39.919008	39.919 008
DARK ($\alpha\mu$) S	$(\alpha\mu)^{-1/2}\ S^{-1/2}$	$(\alpha\mu)^{-1/2}\ S^{1/2}$	$(\alpha\mu)^{1/2}\ S^{-1/2}$	$(\alpha\mu)^{1/2}\ S^{1/2}$	$(\alpha\mu)^{-1/2}\ S^{-1}$	$(\alpha\mu)^{1/2}\ S$
PLNK VALUE	–43.268 161	–43.268 161	–43.268 161	–43.268 161	–43.268 161	–43.268 161
BARYON	–23.026 889	–62.382 358	–24.153 963	–63.509 433	–3.349 154	–83.187 168
BARY/PLNK	20.241 273	–19.114 199	19.114 199	–20.241 273	39.919 008	–39.919008
BARY ($\alpha\mu$) S	$(\alpha\mu)^{1/2}\ S^{1/2}$	$(\alpha\mu)^{1/2}\ S^{-1/2}$	$(\alpha\mu)^{-1/2}\ S^{1/2}$	$(\alpha\mu)^{-1/2}\ S^{-1/2}$	$(\alpha\mu)^{1/2}\ S$	$(\alpha\mu)^{-1/2}\ S^{-1}$
STAR	–2.785 617	–5.039 761	–81.496 560	–83.750 706	–1.658 543	–84.877 779
STAR/PLNK	40.482 545	38.228 397	–38.228 397	–40.482 545	41.609 618	–41.609 618
STAR ($\alpha\mu$) S	$(\alpha\mu)\ S$	$(\alpha\mu)^{-1}\ S$	$(\alpha\mu)\ S^{-1}$	$(\alpha\mu)^{-1}\ S^{-1}$	$(\alpha\mu)^2\ S$	$(\alpha\mu)^{-2}\ S^{-1}$
UNIVERSE	17.455 655	14.074 438	–100.610759	–103.991 979	19.146 267	–105.682 585
UNIV/PLNK	60.723 818	57.342 628	–57.342 628	–60.723 818	62.414 429	–62.414 429
UNIV.($\alpha\mu$) S	$(\alpha\mu)^{3/2}\ S^{3/2}$	$(\alpha\mu)^{-3/2}\ S^{3/2}$	$(\alpha\mu)^{3/2}\ S^{-3/2}$	$(\alpha\mu)^{-3/2}\ S^{-3/2}$	$(\alpha\mu)^3\ S^{3/2}$	$(\alpha\mu)^{-3}\ S^{-3/2}$
DIMENSION	All six types have the same dimensionality: $(\alpha\mu)^{1/2}\ S^{-1/2} = \alpha^{12}\ \mu^2$					

TIME RATIOS

DARK MATTER LEVEL

M = 14.451 796 L = –53.032 612

ROW/COL	t = L/c	T = GM/c^3	K = ħ /Mc^2	Z = G ħ /c^4L	τ = $\sqrt{L^3/GM}$	η = $\sqrt{G^3\hbar^2M/c^{10}L^3}$
t = L/c	1	S^{-1}	$(\alpha\mu)^{-1}$	$(\alpha\mu)^{-1}$ S^{-1}	$S^{1/2}$	$(\alpha\mu)^{-1}$ $S^{-3/2}$
T = GM/c^3		1	$(\alpha\mu)^{-1}$ S	$(\alpha\mu)^{-1}$	$S^{-1/2}$	$(\alpha\mu)^{-1}$ $S^{-1/2}$
K = ħ /Mc^2			1	S^{-1}	$(\alpha\mu)$ $S^{1/2}$	$S^{-3/2}$
Z = G ħ /c^4L				1	$(\alpha\mu)$ $S^{3/2}$	$S^{-1/2}$
τ = $\sqrt{L^3/GM}$					1	$(\alpha\mu)^{-1}$ S^{-2}
η = $\sqrt{G^3\hbar^2M/c^{10}L^3}$						1

BARYON LEVEL

M = –23.776602 L = –12.550068

ROW/COL	t = L/c	T = GM/c^3	K = ħ /Mc^2	Z = G ħ /c^4L	τ = $\sqrt{L^3/GM}$	η = $\sqrt{G^3\hbar^2M/c^{10}L^3}$
t = L/c	1	S	$(\alpha\mu)$	$(\alpha\mu)$ S	$S^{-1/2}$	$(\alpha\mu)$ $S^{3/2}$
T = GM/c^3		1	$(\alpha\mu)$ S^{-1}	$(\alpha\mu)$	$S^{1/2}$	$(\alpha\mu)$ $S^{1/2}$
K = ħ /Mc^2			1	S	$(\alpha\mu)^{-1}$ $S^{-1/2}$	$S^{3/2}$
Z = G ħ /c^4L				1	$(\alpha\mu)^{-1}$ $S^{-3/2}$	$S^{1/2}$
τ = $\sqrt{L^3/GM}$					1	$(\alpha\mu)$ S^2
η = $\sqrt{G^3\hbar^2M/c^{10}L^3}$						1

TIME RATIOS

STELLAR LEVEL

M = 33. 565 995 L = 7.691 205

ROW/COL	t = L/c	$T = GM/c^3$	$K = \hbar/Mc^2$	$Z = G\hbar/c^4L$	$\tau = \sqrt{L^3/GM}$	$\eta = \sqrt{G^3\hbar^2M/c^{10}L^3}$
t = L/c	1	$(\alpha\mu)^2$	S^2	$(\alpha\mu)^2\ S^2$	$(\alpha\mu)^{-1}$	$(\alpha\mu)^3\ S^2$
$T = GM/c^3$		1	$(\alpha\mu)^{-2}\ S^2$	S^2	$(\alpha\mu)^{-3}$	$(\alpha\mu)\ S^2$
$K = \hbar/Mc^2$			1	$(\alpha\mu)^2$	$(\alpha\mu)^{-1}\ S^{-2}$	$(\alpha\mu)^3$
$Z = G\hbar/c^4L$				1	$(\alpha\mu)^{-3}\ S^{-2}$	$(\alpha\mu)$
$\tau = \sqrt{L^3/GM}$					1	$(\alpha\mu)^4\ S^2$
$\eta = \sqrt{G^3\hbar^2M/c^{10}L^3}$						1

UNIVERSE LEVEL

M = 52.680 194 L = 27.932 478

ROW/COL	t = L/c	$T = GM/c^3$	$K = \hbar/Mc^2$	$Z = G\hbar/c^4L$	$\tau = \sqrt{L^3/GM}$	$\eta = \sqrt{G^3\hbar^2M/c^{10}L^3}$
t = L/c	1	$(\alpha\mu)^3$	S^3.	$(\alpha\mu)^3\ S^3$	$(\alpha\mu)^{-3/2}$	$(\alpha\mu)^{9/2}\ S^3$
$T = GM/c^3$		1	$(\alpha\mu)^{-3}\ S^3$	S^3	$(\alpha\mu)^{-9/2}$	$(\alpha\mu)^{3/2}\ S^3$
$K = \hbar/Mc^2$			1	$(\alpha\mu)^3$	$(\alpha\mu)^{-3/2}\ S^{-3}$	$(\alpha\mu)^{9/2}$
$Z = G\hbar/c^4L$				1	$(\alpha\mu)^{-9/2}\ S^{-3}$	$(\alpha\mu)^{3/2}$
$\tau = \sqrt{L^3/GM}$					1	$(\alpha\mu)^6\ S^3$
$\eta = \sqrt{G^3\hbar^2M/c^{10}L^3}$						1

FOUR FORMS OF MATTER

LEVEL	TIME t	TIME T	TIME K	TIME Z	TIME τ	TIME η
Formulae	$t = L/c$	$T = GM/c^3$	$K = \hbar/Mc^2$	$Z = G\hbar/c^4L$	$\tau = \sqrt{L^3/GM}$	$\eta = \sqrt{G^3\hbar^2M/c^{10}L^3}$
At all levels	$t = t_o^2/Z$	$T = t_o^2/K$	$K = t_o^2/T$	$Z = t_o^2/t$	$\tau = t_o^2/\eta$	$\eta = t_o^2/\tau$
DARK MATR	–63.509 433	–24.153 960	–62.382 361	–23.026 889	–83.187 168	–3.349 154
/PLANCK	–20.241 273	19.114 199	–19.114 199	20.241 273	–39.919008	39.919 008
$\alpha\mu S$	$(\alpha\mu)^{-1/2}\ S^{-1/2}$	$(\alpha\mu)^{-1/2}\ S^{1/2}$	$(\alpha\mu)^{1/2}\ S^{-1/2}$	$(\alpha\mu)^{1/2}\ S^{1/2}$	$(\alpha\mu)^{-1/2}\ S^{-1}$	$(\alpha\mu)^{1/2}\ S$
INV DRK MTR	–23.026 889	–24.153 960	–62.382 361	–63.309 433	–22.463 353	–64.072 969
/PLANCK	20.241 273	19.114 199	–19.114 199	–20.241 273	20.804 808	–20.804 808
$\alpha\mu S$	$(\alpha\mu)^{1/2}\ S^{1/2}$	$(\alpha\mu)^{-1/2}\ S^{1/2}$	$(\alpha\mu)^{1/2}\ S^{-1/2}$	$(\alpha\mu)^{-1/2}\ S^{-1/2}$	$(\alpha\mu)\ S^{1/2}$	$(\alpha\mu)^{-1}\ S^{-1/2}$
PLANCK	-43.268 161	-43.268 161	-43.268 161	-43.268 161	-43.268 161	-43.268 161
BARYONS	–23.026 889	–62.382 358	–24.153 963	–63.509 433	–3.349 154	–83.187 168
/PLANCK	20.241 273	–19.114 199	19.114 199	–20.241 273	39.919 008	–39.919008
$\alpha\mu S$	$(\alpha\mu)^{1/2}\ S^{1/2}$	$(\alpha\mu)^{1/2}\ S^{-1/2}$	$(\alpha\mu)^{-1/2}\ S^{1/2}$	$(\alpha\mu)^{-1/2}\ S^{-1/2}$	$(\alpha\mu)^{1/2}\ S$	$(\alpha\mu)^{-1/2}\ S^{-1}$
INV BAR	–63.509 433	–62.382 361	–24.153 960	–23.026 889	–64.072 969	–22.463 353
/PLANCK	–20.241 273	–19.114 199	19.114 199	20.241 273	–20.804 808	20.804 808
$\alpha\mu S$	$(\alpha\mu)^{-1/2}\ S^{-1/2}$	$(\alpha\mu)^{1/2}\ S^{-1/2}$	$(\alpha\mu)^{-1/2}\ S^{1/2}$	$(\alpha\mu)^{1/2}\ S^{1/2}$	$(\alpha\mu)^{-1}\ S^{-1/2}$	$(\alpha\mu)\ S^{1/2}$

FOUR FORMS OF MATTER $(\alpha\mu)$

	LENGTH	MASS	ML	M/L	M/L^2	M/L^3
DARK MATR	–53.032 612	14.451796	–38.580 816	67.484 408	120.517 020	173.549 632
/PLANCK	–20.241 272	19.114 199	–1.127 074	39.355 471	59.596 743	79.838 015
αμS	$(\alpha\mu)^{-1/2}S^{-1/2}$	$(\alpha\mu)^{-1/2}S^{1/2}$	$(\alpha\mu)^{-1}$	S	$(\alpha\mu)^{1/2}S^{3/2}$	$(\alpha\mu)\ S^2$
INV DRK MTR	–12.550 068	14.451796	1.901 728	27.001 864	39.551 932	52.102 000
/PLANCK	20.241 272	19.114 199	39.355 471	–1.127 074	–21.368 345	–41.609 617
αμS	$(\alpha\mu)^{1/2}S^{1/2}$	$(\alpha\mu)^{-1/2}S^{1/2}$	S	$(\alpha\mu)^{-1}$	$(\alpha\mu)^{-3/2}S^{-1/2}$	$(\alpha\mu)^{-2}S^{-1}$
PLANCK	–32.791 341	–4.662 404	–37.453 745	28.128 937	60.920 278	93.711 619
BARYONS	–12.550 068	–23.776 602	–36.326 670	–11.226 534	1.323 534	13.873 602
/PLANCK	20.241 272	–19.114 199	1.127 074	–39.355 471	–59.596 743	–79.838 015
αμS	$(\alpha\mu)^{1/2}S^{1/2}$	$(\alpha\mu)^{1/2}S^{-1/2}$	$(\alpha\mu)$	S^{-1}	$(\alpha\mu)^{-1/2}S^{-3/2}$	$(\alpha\mu)^{-1}S^{-2}$
INV BAR	–53.032 612	–23.776 602	–76.809 214	29.256 010	82.288 622	135.321 234
/PLANCK	–20.241 272	–19.114 199	–39.355 471	1.127 074	21.368 345	41.609 617
αμS	$(\alpha\mu)^{-1/2}S^{-1/2}$	$(\alpha\mu)^{1/2}S^{-1/2}$	S^{-1}	$(\alpha\mu)$	$(\alpha\mu)^{3/2}S^{1/2}$	$(\alpha\mu)^2\ S$

DARK MATTER LEVEL

M = 14.451 796 L = –53.032 612

ROW/COL	t = L/c	T = GM/c^3	K = ħ /Mc^2	Z = G ħ /c^4L	τ = $\sqrt{L^3/GM}$	η = $\sqrt{G^3\hbar^2M/c^{10}L^3}$
t = L/c	1	S^{-1}	$(\alpha\mu)^{-1}$	$(\alpha\mu)^{-1}\ S^{-1}$	$S^{1/2}$	$(\alpha\mu)^{-1}\ S^{-3/2}$
T = GM/c^3		1	$(\alpha\mu)^{-1}$ S	$(\alpha\mu)^{-1}$	$S^{-1/2}$	$(\alpha\mu)^{-1}\ S^{-1/2}$
K = ħ /Mc^2			1	S^{-1}	$(\alpha\mu)\ S^{1/2}$	$S^{-3/2}$
Z = G ħ /c^4L				1	$(\alpha\mu)\ S^{3/2}$	$S^{-1/2}$
τ = $\sqrt{L^3/GM}$					1	$(\alpha\mu)^{-1}\ S^{-2}$
η = $\sqrt{G^3\hbar^2M/c^{10}L^3}$						1

BARYON LEVEL

M = –23.776602 L = –12.550068

ROW/COL	t = L/c	T = GM/c^3	K = ħ /Mc^2	Z = G ħ /c^4L	τ = $\sqrt{L^3/GM}$	η = $\sqrt{G^3\hbar^2M/c^{10}L^3}$
t = L/c	1	S	$(\alpha\mu)$	$(\alpha\mu)$ S	$S^{-1/2}$	$(\alpha\mu)\ S^{3/2}$
T = GM/c^3		1	$(\alpha\mu)\ S^{-1}$	$(\alpha\mu)$	$S^{1/2}$	$(\alpha\mu)\ S^{1/2}$
K = ħ /Mc^2			1	S	$(\alpha\mu)^{-1}\ S^{-1/2}$	$S^{3/2}$
Z = G ħ /c^4L				1	$(\alpha\mu)^{-1}\ S^{-3/2}$	$S^{1/2}$
τ = $\sqrt{L^3/GM}$					1	$(\alpha\mu)\ S^2$
η = $\sqrt{G^3\hbar^2M/c^{10}L^3}$						1

INVERSE DARK MATTER LEVEL

M = 14.451 796 L = –12.55068

ROW/COL	t = L/c	$T = GM/c^3$	$K = \hbar/Mc^2$	$Z = G\hbar/c^4L$	$\tau = \sqrt{L^3/GM}$	$\eta = \sqrt{G^3\hbar^2M/c^{10}L^3}$
t = L/c	1	$(\alpha\mu)$	S	$(\alpha\mu)$ S	$(\alpha\mu)^{-1/2}$	$(\alpha\mu)^{3/2}$ S
$T = GM/c^3$		1	$(\alpha\mu)^{-1}$ S	S	$(\alpha\mu)^{-3/2}$	$(\alpha\mu)^{1/2}$ S
$K = \hbar/Mc^2$			1	$(\alpha\mu)$	$(\alpha\mu)^{-1/2}$ S^{-1}	$(\alpha\mu)^{3/2}$
$Z = G\hbar/c^4L$				1	$(\alpha\mu)^{-3/2}$ S^{-1}	$(\alpha\mu)^{1/2}$
$\tau = \sqrt{L^3/GM}$					1	$(\alpha\mu)^2$ S
$\eta = \sqrt{G^3\hbar^2M/c^{10}L^3}$						1

INVERSE BARYON LEVEL

M = –23.776602 L = –53.032 612

ROW/COL	t = L/c	$T = GM/c^3$	$K = \hbar/Mc^2$	$Z = G\hbar/c^4L$	$\tau = \sqrt{L^3/GM}$	$\eta = \sqrt{G^3\hbar^2M/c^{10}L^3}$
t = L/c	1	$(\alpha\mu)^{-1}$	S^{-1}	$(\alpha\mu)^{-1}$ S^{-1}	$(\alpha\mu)^{1/2}$	$(\alpha\mu)^{-3/2}$ S^{-1}
$T = GM/c^3$		1	$(\alpha\mu)$ S^{-1}	S^{-1}	$(\alpha\mu)^{3/2}$	$(\alpha\mu)^{-1/2}$ S^{-1}
$K = \hbar/Mc^2$			1	$(\alpha\mu)^{-1}$	$(\alpha\mu)^{1/2}$ S^1	$(\alpha\mu)^{-3/2}$
$Z = G\hbar/c^4L$				1	$(\alpha\mu)^{3/2}$ S^1	$(\alpha\mu)^{-1/2}$
$\tau = \sqrt{L^3/GM}$					1	$(\alpha\mu)^{-2}$ S^{-1}
$\eta = \sqrt{G^3\hbar^2M/c^{10}L^3}$						1

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July 16, 2008

		M ·L	M/L	
DARK MATR	$\hbar/c\ (\alpha\mu)^{-1}$	–38.580 816	67.484 408	$c^2/G\ S$
BARYON	$\hbar/c\ (\alpha\mu)$	–36.326 670	–11.226 534	$c^2/G\ S^{-1}$
PLANCK	$\hbar/c$	–37.453 745	28.128 937	c^2/G
INV–BARYON	$\hbar/c\ S^{-1}$	–76.809 214	29.256 010	$c^2/G\ (\alpha\mu)$
INV–DARK	$\hbar/c\ S$	1.901 728	27.001 864	$c^2/G\ (\alpha\mu)^{-1}$
STAR	$\hbar/c\ S^2$	41.257 200	25.874 790	$c^2/G\ (\alpha\mu)^{-2}$
UNIVERSE	$\hbar/c\ S^3$	80.612 672	24.747 716	$c^2/G\ (\alpha\mu)^{-3}$
	In order of increasing M/L			
BARYON	$\hbar/c\ (\alpha\mu)$	–36.326 670	–11.226 534	$c^2/G\ S^{-1}$
UNIVERSE	$\hbar/c\ S^3$	80.612 672	24.747 716	$c^2/G\ (\alpha\mu)^{-3}$
STAR	$\hbar/c\ S^2$	41.257 200	25.874 790	$c^2/G\ (\alpha\mu)^{-2}$
INV–DARK	$\hbar/c\ S$	1.901 728	27.001 864	$c^2/G\ (\alpha\mu)^{-1}$
PLANCK	$\hbar/c$	–37.453 745	28.128 937	c^2/G
INV–BARYON	$\hbar/c\ S^{-1}$	–76.809 214	29.256 010	$c^2/G\ (\alpha\mu)$
DARK MATR	$\hbar/c\ (\alpha\mu)^{-1}$	–38.580 816	67.484 408	$c^2/G\ S$
	In order of increasing M ·L			
INV–BARYON	$\hbar/c\ S^{-1}$	–76.809 214	29.256 010	$c^2/G\ (\alpha\mu)$
DARK MATR	$\hbar/c\ (\alpha\mu)^{-1}$	–38.580 816	67.484 408	$c^2/G\ S$
PLANCK	$\hbar/c$	–37.453 745	28.128 937	c^2/G
BARYON	$\hbar/c\ (\alpha\mu)$	–36.326 670	–11.226 534	$c^2/G\ S^{-1}$
INV–DARK	$\hbar/c\ S$	1.901 728	27.001 864	$c^2/G\ (\alpha\mu)^{-1}$
STAR	$\hbar/c\ S^2$	41.257 200	25.874 790	$c^2/G\ (\alpha\mu)^{-2}$
UNIVERSE	$\hbar/c\ S^3$	80.612 672	24.747 716	$c^2/G\ (\alpha\mu)^{-3}$

alpha mu table #3b

n horizontal , m vertical

$a := -2.136834673$ $\quad n := 0, 1 .. 14$

$b := 3.263908788$ $\quad m := 0, 1 .. 15$

$K_{m,n} := n \cdot a + m \cdot b$

$K =$

	0	1	2	3	4
0	0	-2.136834673	-4.273669346	-6.410504019	-8.547338692
1	3.263908788	1.127074115	-1.009760558	-3.146595231	-5.283429904
2	6.527817576	4.390982903	2.25414823	0.117313557	-2.019521116
3	9.791726364	7.654891691	5.518057018	3.381222345	1.244387672
4	13.055635152	10.918800479	8.781965806	6.645131133	4.50829646
5	16.31954394	14.182709267	12.045874594	9.909039921	7.772205248
6	19.583452728	17.446618055	15.309783382	13.172948709	11.036114036
7	22.847361516	20.710526843	18.57369217	16.436857497	14.300022824
8	26.111270304	23.974435631	21.837600958	19.700766285	17.563931612
9	29.375179092	27.238344419	25.101509746	22.964675073	20.8278404
10	32.63908788	30.502253207	28.365418534	26.228583861	24.091749188
11	35.902996668	33.766161995	31.629327322	29.492492649	27.355657976
12	39.166905456	37.030070783	34.89323611	32.756401437	30.619566764
13	42.430814244	40.293979571	38.157144898	36.020310225	33.883475552
14	45.694723032	43.557888359	41.421053686	39.284219013	37.14738434
15	48.95863182	46.821797147	44.684962474	42.548127801	40.411293128

alpha mu table #3b

n horizontal , m vertical

$a := -2.136834673$ $n := 0, 1 .. 14$

$b := 3.263908788$ $m := 0, 1 .. 15$

$K_{m,n} := n \cdot a + m \cdot b$

$K =$

	5	6	7	8	9
0	-10.684173365	-12.821008038	-14.957842711	-17.094677384	-19.231512057
1	-7.420264577	-9.55709925	-11.693933923	-13.830768596	-15.967603269
2	-4.156355789	-6.293190462	-8.430025135	-10.566859808	-12.703694481
3	-0.892447001	-3.029281674	-5.166116347	-7.30295102	-9.439785693
4	2.371461787	0.234627114	-1.902207559	-4.039042232	-6.175876905
5	5.635370575	3.498535902	1.361701229	-0.775133444	-2.911968117
6	8.899279363	6.76244469	4.625610017	2.488775344	0.351940671
7	12.163188151	10.026353478	7.889518805	5.752684132	3.615849459
8	15.427096939	13.290262266	11.153427593	9.01659292	6.879758247
9	18.691005727	16.554171054	14.417336381	12.280501708	10.143667035
10	21.954914515	19.818079842	17.681245169	15.544410496	13.407575823
11	25.218823303	23.08198863	20.945153957	18.808319284	16.671484611
12	28.482732091	26.345897418	24.209062745	22.072228072	19.935393399
13	31.746640879	29.609806206	27.472971533	25.33613686	23.199302187
14	35.010549667	32.873714994	30.736880321	28.600045648	26.463210975
15	38.274458455	36.137623782	34.000789109	31.863954436	29.727119763

alpha mu table #3b

n horizontal , m vertical

$a := -2.136834673$ $\quad n := 0, 1 .. 14$

$b := 3.263908788$ $\quad m := 0, 1 .. 15$

$K_{m,n} := n \cdot a + m \cdot b$

$K =$

	10	11	12	13	14
0	-21.36834673	-23.505181403	-25.642016076	-27.778850749	-29.915685422
1	-18.104437942	-20.241272615	-22.378107288	-24.514941961	-26.651776634
2	-14.840529154	-16.977363827	-19.1141985	-21.251033173	-23.387867846
3	-11.576620366	-13.713455039	-15.850289712	-17.987124385	-20.123959058
4	-8.312711578	-10.449546251	-12.586380924	-14.723215597	-16.86005027
5	-5.04880279	-7.185637463	-9.322472136	-11.459306809	-13.596141482
6	-1.784894002	-3.921728675	-6.058563348	-8.195398021	-10.332232694
7	1.479014786	-0.657819887	-2.79465456	-4.931489233	-7.068323906
8	4.742923574	2.606088901	0.469254228	-1.667580445	-3.804415118
9	8.006832362	5.869997689	3.733163016	1.596328343	-0.54050633
10	11.27074115	9.133906477	6.997071804	4.860237131	2.723402458
11	14.534649938	12.397815265	10.260980592	8.124145919	5.987311246
12	17.798558726	15.661724053	13.52488938	11.388054707	9.251220034
13	21.062467514	18.925632841	16.788798168	14.651963495	12.515128822
14	24.326376302	22.189541629	20.052706956	17.915872283	15.77903761
15	27.59028509	25.453450417	23.316615744	21.179781071	19.042946398

alpha mu table #3b

n horizontal , m vertical

$a := -2.136834673$ $\quad n := 0, 1 .. 24$

$b := 3.263908788$ $\quad m := 0, 1 .. 15$

$K_{m,n} := n \cdot a + m \cdot b$

$K =$

	15	16	17	18	19
0	-32.052520095	-34.189354768	-36.326189441	-38.463024114	-40.599858787
1	-28.788611307	-30.92544598	-33.062280653	-35.199115326	-37.335949999
2	-25.524702519	-27.661537192	-29.798371865	-31.935206538	-34.072041211
3	-22.260793731	-24.397628404	-26.534463077	-28.67129775	-30.808132423
4	-18.996884943	-21.133719616	-23.270554289	-25.407388962	-27.544223635
5	-15.732976155	-17.869810828	-20.006645501	-22.143480174	-24.280314847
6	-12.469067367	-14.60590204	-16.742736713	-18.879571386	-21.016406059
7	-9.205158579	-11.341993252	-13.478827925	-15.615662598	-17.752497271
8	-5.941249791	-8.078084464	-10.214919137	-12.35175381	-14.488588483
9	-2.677341003	-4.814175676	-6.951010349	-9.087845022	-11.224679695
10	0.586567785	-1.550266888	-3.687101561	-5.823936234	-7.960770907
11	3.850476573	1.7136419	-0.423192773	-2.560027446	-4.696862119
12	7.114385361	4.977550688	2.840716015	0.703881342	-1.432953331
13	10.378294149	8.241459476	6.104624803	3.96779013	1.830955457
14	13.642202937	11.505368264	9.368533591	7.231698918	5.094864245
15	16.906111725	14.769277052	12.632442379	10.495607706	8.358773033

alpha mu table #3b

n horizontal , m vertical

$a := -2.136834673$ $n := 0, 1 .. 24$

$b := 3.263908788$ $m := 0, 1 .. 15$

$K_{m,n} := n \cdot a + m \cdot b$

K =

	20	21	22	23	24
0	-42.73669346	-44.873528133	-47.010362806	-49.147197479	-51.284032152
1	-39.472784672	-41.609619345	-43.746454018	-45.883288691	-48.020123364
2	-36.208875884	-38.345710557	-40.48254523	-42.619379903	-44.756214576
3	-32.944967096	-35.081801769	-37.218636442	-39.355471115	-41.492305788
4	-29.681058308	-31.817892981	-33.954727654	-36.091562327	-38.228397
5	-26.41714952	-28.553984193	-30.690818866	-32.827653539	-34.964488212
6	-23.153240732	-25.290075405	-27.426910078	-29.563744751	-31.700579424
7	-19.889331944	-22.026166617	-24.16300129	-26.299835963	-28.436670636
8	-16.625423156	-18.762257829	-20.899092502	-23.035927175	-25.172761848
9	-13.361514368	-15.498349041	-17.635183714	-19.772018387	-21.90885306
10	-10.09760558	-12.234440253	-14.371274926	-16.508109599	-18.644944272
11	-6.833696792	-8.970531465	-11.107366138	-13.244200811	-15.381035484
12	-3.569788004	-5.706622677	-7.84345735	-9.980292023	-12.117126696
13	-0.305879216	-2.442713889	-4.579548562	-6.716383235	-8.853217908
14	2.958029572	0.821194899	-1.315639774	-3.452474447	-5.58930912
15	6.22193836	4.085103687	1.948269014	-0.188565659	-2.325400332

alpha mu table #3b

n horizontal , m vertical

$a := -2.136834673$ $n := 0, 1 .. 30$

$b := 3.263908788$ $m := 0, 1 .. 15$

$K_{m,n} := n \cdot a + m \cdot b$

$K =$

	25	26	27	28	29
0	-53.420866825	-55.557701498	-57.694536171	-59.831370844	-61.968205517
1	-50.156958037	-52.29379271	-54.430627383	-56.567462056	-58.704296729
2	-46.893049249	-49.029883922	-51.166718595	-53.303553268	-55.440387941
3	-43.629140461	-45.765975134	-47.902809807	-50.03964448	-52.176479153
4	-40.365231673	-42.502066346	-44.638901019	-46.775735692	-48.912570365
5	-37.101322885	-39.238157558	-41.374992231	-43.511826904	-45.648661577
6	-33.837414097	-35.97424877	-38.111083443	-40.247918116	-42.384752789
7	-30.573505309	-32.710339982	-34.847174655	-36.984009328	-39.120844001
8	-27.309596521	-29.446431194	-31.583265867	-33.72010054	-35.856935213
9	-24.045687733	-26.182522406	-28.319357079	-30.456191752	-32.593026425
10	-20.781778945	-22.918613618	-25.055448291	-27.192282964	-29.329117637
11	-17.517870157	-19.65470483	-21.791539503	-23.928374176	-26.065208849
12	-14.253961369	-16.390796042	-18.527630715	-20.664465388	-22.801300061
13	-10.990052581	-13.126887254	-15.263721927	-17.4005566	-19.537391273
14	-7.726143793	-9.862978466	-11.999813139	-14.136647812	-16.273482485
15	-4.462235005	-6.599069678	-8.735904351	-10.872739024	-13.009573697

alpha mu table #3

n horizontal , m vertical

$a := -2.136835$ $n := 0, 1 .. 35$

$b := 3.263909$ $m := 0, 1 .. 17$

$K_{m,n} := n \cdot a + m \cdot b$

$K =$

	30	31	32	33	34	35
0	-64.10505	-66.241885	-68.37872	-70.515555	-72.65239	-74.789225
1	-60.841141	-62.977976	-65.114811	-67.251646	-69.388481	-71.525316
2	-57.577232	-59.714067	-61.850902	-63.987737	-66.124572	-68.261407
3	-54.313323	-56.450158	-58.586993	-60.723828	-62.860663	-64.997498
4	-51.049414	-53.186249	-55.323084	-57.459919	-59.596754	-61.733589
5	-47.785505	-49.92234	-52.059175	-54.19601	-56.332845	-58.46968
6	-44.521596	-46.658431	-48.795266	-50.932101	-53.068936	-55.205771
7	-41.257687	-43.394522	-45.531357	-47.668192	-49.805027	-51.941862
8	-37.993778	-40.130613	-42.267448	-44.404283	-46.541118	-48.677953
9	-34.729869	-36.866704	-39.003539	-41.140374	-43.277209	-45.414044
10	-31.46596	-33.602795	-35.73963	-37.876465	-40.0133	-42.150135
11	-28.202051	-30.338886	-32.475721	-34.612556	-36.749391	-38.886226
12	-24.938142	-27.074977	-29.211812	-31.348647	-33.485482	-35.622317
13	-21.674233	-23.811068	-25.947903	-28.084738	-30.221573	-32.358408
14	-18.410324	-20.547159	-22.683994	-24.820829	-26.957664	-29.094499
15	-15.146415	-17.28325	-19.420085	-21.55692	-23.693755	-25.83059
16	-11.882506	-14.019341	-16.156176	-18.293011	-20.429846	-22.566681
17	-8.618597	-10.755432	-12.892267	-15.029102	-17.165937	-19.302772

alpha mu table #3b

n horizontal , m vertical

$a := -2.136834673$ $\quad n := 0, 1 .. 24$

$b := 3.263908788$ $\quad m := 0, 1 .. 15$

$K_{m,n} := n \cdot a + (m + 15) \cdot b$

		0	1	2	3	4
15	0	48.95863182	46.821797147	44.684962474	42.548127801	40.411293128
	1	52.222540608	50.085705935	47.948871262	45.812036589	43.675201916
	2	55.486449396	53.349614723	51.21278005	49.075945377	46.939110704
	3	58.750358184	56.613523511	54.476688838	52.339854165	50.203019492
	4	62.014266972	59.877432299	57.740597626	55.603762953	53.46692828
20	5	65.27817576	63.141341087	61.004506414	58.867671741	56.730837068
	6	68.542084548	66.405249875	64.268415202	62.131580529	59.994745856
K =	7	71.805993336	69.669158663	67.53232399	65.395489317	63.258654644
	8	75.069902124	72.933067451	70.796232778	68.659398105	66.522563432
	9	78.333810912	76.196976239	74.060141566	71.923306893	69.78647222
25	10	81.5977197	79.460885027	77.324050354	75.187215681	73.050381008
	11	84.861628488	82.724793815	80.587959142	78.451124469	76.314289796
	12	88.125537276	85.988702603	83.85186793	81.715033257	79.578198584
	13	91.389446064	89.252611391	87.115776718	84.978942045	82.842107372
	14	94.653354852	92.516520179	90.379685506	88.242850833	86.10601616
30	15	97.91726364	95.780428967	93.643594294	91.506759621	89.369924948

alpha mu table #3b

n horizontal , m vertical

$a := -2.136834673$ $n := 0, 1 .. 24$

$b := 3.263908788$ $m := 0, 1 .. 15$

$K_{m,n} := n \cdot a + (m + 15) \cdot b$

		5	6	7	8	9
15	0	38.274458455	36.137623782	34.000789109	31.863954436	29.727119763
	1	41.538367243	39.40153257	37.264697897	35.127863224	32.991028551
	2	44.802276031	42.665441358	40.528606685	38.391772012	36.254937339
	3	48.066184819	45.929350146	43.792515473	41.6556808	39.518846127
	4	51.330093607	49.193258934	47.056424261	44.919589588	42.782754915
20	5	54.594002395	52.457167722	50.320333049	48.183498376	46.046663703
	6	57.857911183	55.72107651	53.584241837	51.447407164	49.310572491
K =	7	61.121819971	58.984985298	56.848150625	54.711315952	52.574481279
	8	64.385728759	62.248894086	60.112059413	57.97522474	55.838390067
	9	67.649637547	65.512802874	63.375968201	61.239133528	59.102298855
25	10	70.913546335	68.776711662	66.639876989	64.503042316	62.366207643
	11	74.177455123	72.04062045	69.903785777	67.766951104	65.630116431
	12	77.441363911	75.304529238	73.167694565	71.030859892	68.894025219
	13	80.705272699	78.568438026	76.431603353	74.29476868	72.157934007
	14	83.969181487	81.832346814	79.695512141	77.558677468	75.421842795
30	15	87.233090275	85.096255602	82.959420929	80.822586256	78.685751583

alpha mu table #3b

n horizontal , m vertical

$a := -2.136834673$ $n := 0, 1 .. 24$

$b := 3.263908788$ $m := 0, 1 .. 15$

$K_{m,n} := n \cdot a + (m + 15) \cdot b$

		10	11	12	13	14
15	0	27.59028509	25.453450417	23.316615744	21.179781071	19.042946398
	1	30.854193878	28.717359205	26.580524532	24.443689859	22.306855186
	2	34.118102666	31.981267993	29.84443332	27.707598647	25.570763974
	3	37.382011454	35.245176781	33.108342108	30.971507435	28.834672762
	4	40.645920242	38.509085569	36.372250896	34.235416223	32.09858155
20	5	43.90982903	41.772994357	39.636159684	37.499325011	35.362490338
	6	47.173737818	45.036903145	42.900068472	40.763233799	38.626399126
K =	7	50.437646606	48.300811933	46.16397726	44.027142587	41.890307914
	8	53.701555394	51.564720721	49.427886048	47.291051375	45.154216702
	9	56.965464182	54.828629509	52.691794836	50.554960163	48.41812549
25	10	60.22937297	58.092538297	55.955703624	53.818868951	51.682034278
	11	63.493281758	61.356447085	59.219612412	57.082777739	54.945943066
	12	66.757190546	64.620355873	62.4835212	60.346686527	58.209851854
	13	70.021099334	67.884264661	65.747429988	63.610595315	61.473760642
	14	73.285008122	71.148173449	69.011338776	66.874504103	64.73766943
30	15	76.54891691	74.412082237	72.275247564	70.138412891	68.001578218

alpha mu table #3b

n horizontal , m vertical

$a := -2.136834673$ $n := 0, 1 .. 24$

$b := 3.263908788$ $m := 0, 1 .. 15$

$K_{m,n} := n \cdot a + (m + 15) \cdot b$

		15	16	17	18	19
15	0	16.906111725	14.769277052	12.632442379	10.495607706	8.358773033
	1	20.170020513	18.03318584	15.896351167	13.759516494	11.622681821
	2	23.433929301	21.297094628	19.160259955	17.023425282	14.886590609
	3	26.697838089	24.561003416	22.424168743	20.28733407	18.150499397
	4	29.961746877	27.824912204	25.688077531	23.551242858	21.414408185
20	5	33.225655665	31.088820992	28.951986319	26.815151646	24.678316973
	6	36.489564453	34.35272978	32.215895107	30.079060434	27.942225761
K =	7	39.753473241	37.616638568	35.479803895	33.342969222	31.206134549
	8	43.017382029	40.880547356	38.743712683	36.60687801	34.470043337
	9	46.281290817	44.144456144	42.007621471	39.870786798	37.733952125
25	10	49.545199605	47.408364932	45.271530259	43.134695586	40.997860913
	11	52.809108393	50.67227372	48.535439047	46.398604374	44.261769701
	12	56.073017181	53.936182508	51.799347835	49.662513162	47.525678489
	13	59.336925969	57.200091296	55.063256623	52.92642195	50.789587277
	14	62.600834757	60.464000084	58.327165411	56.190330738	54.053496065
30	15	65.864743545	63.727908872	61.591074199	59.454239526	57.317404853

alpha mu table #3b

n horizontal , m vertical

$a := -2.136834673$ $n := 0, 1 .. 30$

$b := 3.263908788$ $m := 0, 1 .. 15$

$K_{m,n} := n \cdot a + (m + 15) \cdot b$

		20	21	22	23	24
15	0	6.22193836	4.085103687	1.948269014	-0.188565659	-2.325400332
	1	9.485847148	7.349012475	5.212177802	3.075343129	0.938508456
	2	12.749755936	10.612921263	8.47608659	6.339251917	4.202417244
	3	16.013664724	13.876830051	11.739995378	9.603160705	7.466326032
	4	19.277573512	17.140738839	15.003904166	12.867069493	10.73023482
20	5	22.5414823	20.404647627	18.267812954	16.130978281	13.994143608
	6	25.805391088	23.668556415	21.531721742	19.394887069	17.258052396
K =	7	29.069299876	26.932465203	24.79563053	22.658795857	20.521961184
	8	32.333208664	30.196373991	28.059539318	25.922704645	23.785869972
	9	35.597117452	33.460282779	31.323448106	29.186613433	27.04977876
25	10	38.86102624	36.724191567	34.587356894	32.450522221	30.313687548
	11	42.124935028	39.988100355	37.851265682	35.714431009	33.577596336
	12	45.388843816	43.252009143	41.11517447	38.978339797	36.841505124
	13	48.652752604	46.515917931	44.379083258	42.242248585	40.105413912
	14	51.916661392	49.779826719	47.642992046	45.506157373	43.3693227
30	15	55.18057018	53.043735507	50.906900834	48.770066161	46.633231488

alpha mu table #3b

n horizontal , m vertical

$a := -2.136834673$ $n := 0, 1 .. 30$

$b := 3.263908788$ $m := 0, 1 .. 15$

$K_{m,n} := n \cdot a + (m + 15) \cdot b$

		25	26	27	28	29
15	0	-4.462235005	-6.599069678	-8.735904351	-10.872739024	-13.009573697
	1	-1.198326217	-3.33516089	-5.471995563	-7.608830236	-9.745664909
	2	2.065582571	-0.071252102	-2.208086775	-4.344921448	-6.481756121
	3	5.329491359	3.192656686	1.055822013	-1.08101266	-3.217847333
	4	8.593400147	6.456565474	4.319730801	2.182896128	0.046061455
20	5	11.857308935	9.720474262	7.583639589	5.446804916	3.309970243
	6	15.121217723	12.98438305	10.847548377	8.710713704	6.573879031
K =	7	18.385126511	16.248291838	14.111457165	11.974622492	9.837787819
	8	21.649035299	19.512200626	17.375365953	15.23853128	13.101696607
	9	24.912944087	22.776109414	20.639274741	18.502440068	16.365605395
25	10	28.176852875	26.040018202	23.903183529	21.766348856	19.629514183
	11	31.440761663	29.30392699	27.167092317	25.030257644	22.893422971
	12	34.704670451	32.567835778	30.431001105	28.294166432	26.157331759
	13	37.968579239	35.831744566	33.694909893	31.55807522	29.421240547
	14	41.232488027	39.095653354	36.958818681	34.821984008	32.685149335
30	15	44.496396815	42.359562142	40.222727469	38.085892796	35.949058123

alpha mu table #3

n horizontal , m vertical

$a := -2.136835$ $n := 0, 1 .. 35$

$b := 3.263909$ $m := 0, 1 .. 15$

$K_{m,n} := n \cdot a + (m + 15) \cdot b$

		30	31	32	33	34	35
15	0	-15.146415	-17.28325	-19.420085	-21.55692	-23.693755	-25.83059
	1	-11.882506	-14.019341	-16.156176	-18.293011	-20.429846	-22.566681
	2	-8.618597	-10.755432	-12.892267	-15.029102	-17.165937	-19.302772
	3	-5.354688	-7.491523	-9.628358	-11.765193	-13.902028	-16.038863
	4	-2.090779	-4.227614	-6.364449	-8.501284	-10.638119	-12.774954
20	5	1.17313	-0.963705	-3.10054	-5.237375	-7.37421	-9.511045
	6	4.437039	2.300204	0.163369	-1.973466	-4.110301	-6.247136
K =	7	7.700948	5.564113	3.427278	1.290443	-0.846392	-2.983227
	8	10.964857	8.828022	6.691187	4.554352	2.417517	0.280682
	9	14.228766	12.091931	9.955096	7.818261	5.681426	3.544591
25	10	17.492675	15.35584	13.219005	11.08217	8.945335	6.8085
	11	20.756584	18.619749	16.482914	14.346079	12.209244	10.072409
	12	24.020493	21.883658	19.746823	17.609988	15.473153	13.336318
	13	27.284402	25.147567	23.010732	20.873897	18.737062	16.600227
	14	30.548311	28.411476	26.274641	24.137806	22.000971	19.864136
30	15	33.81222	31.675385	29.53855	27.401715	25.26488	23.128045

Half-powers

alpha mu table #1

n horizontal , m vertical

mean

$a := -1.068418$ $n := 0, 1 .. 25$

alpha/2 vs mu/2

$b := 1.631955$ $m := 0, 1 .. 17$

$K_{m,n} := n \cdot a + m \cdot b$

α α^2 α^3

μ 1

μ^2 2

μ^3 3

$K =$

	0	1	2	3	4	5	6
0	0	-1.068418	-2.136836	-3.205254	-4.273672	-5.34209	-6.410508
1	1.631955	0.563537	-0.504881	-1.573299	-2.641717	-3.710135	-4.778553
2	3.26391	2.195492	1.127074	0.058656	-1.009762	-2.07818	-3.146598
3	4.895865	3.827447	2.759029	1.690611	0.622193	-0.446225	-1.514643
4	6.52782	5.459402	4.390984	3.322566	2.254148	1.18573	0.117312
5	8.159775	7.091357	6.022939	4.954521	3.886103	2.817685	1.749267
6	9.79173	8.723312	7.654894	6.586476	5.518058	4.44964	3.381222
7	11.423685	10.355267	9.286849	8.218431	7.150013	6.081595	5.013177
8	13.05564	11.987222	10.918804	9.850386	8.781968	7.71355	6.645132
9	14.687595	13.619177	12.550759	11.482341	10.413923	9.345505	8.277087
10	16.31955	15.251132	14.182714	13.114296	12.045878	10.97746	9.909042
11	17.951505	16.883087	15.814669	14.746251	13.677833	12.609415	11.540997
12	19.58346	18.515042	17.446624	16.378206	15.309788	14.24137	13.172952
13	21.215415	20.146997	19.078579	18.010161	16.941743	15.873325	14.804907
14	22.84737	21.778952	20.710534	19.642116	18.573698	17.50528	16.436862
15	24.479325	23.410907	22.342489	21.274071	20.205653	19.137235	18.068817
16	26.11128	25.042862	23.974444	22.906026	21.837608	20.76919	19.700772
17	27.743235	26.674817	25.606399	24.537981	23.469563	22.401145	21.332727

alpha mu table #1

n horizontal , m vertical

$a := -1.068418$ $n := 0, 1 .. 25$

alpha/2 vs mu/2

$b := 1.631955$ $m := 0, 1 .. 17$

$K_{m,n} := n \cdot a + m \cdot b$

$K =$

	6	7	8	9	10	11	12
0	-6.410508	-7.478926	-8.547344	-9.615762	-10.68418	-11.752598	-12.821016
1	-4.778553	-5.846971	-6.915389	-7.983807	-9.052225	-10.120643	-11.189061
2	-3.146598	-4.215016	-5.283434	-6.351852	-7.42027	-8.488688	-9.557106
3	-1.514643	-2.583061	-3.651479	-4.719897	-5.788315	-6.856733	-7.925151
4	0.117312	-0.951106	-2.019524	-3.087942	-4.15636	-5.224778	-6.293196
5	1.749267	0.680849	-0.387569	-1.455987	-2.524405	-3.592823	-4.661241
6	3.381222	2.312804	1.244386	0.175968	-0.89245	-1.960868	-3.029286
7	5.013177	3.944759	2.876341	1.807923	0.739505	-0.328913	-1.397331
8	6.645132	5.576714	4.508296	3.439878	2.37146	1.303042	0.234624
9	8.277087	7.208669	6.140251	5.071833	4.003415	2.934997	1.866579
10	9.909042	8.840624	7.772206	6.703788	5.63537	4.566952	3.498534
11	11.540997	10.472579	9.404161	8.335743	7.267325	6.198907	5.130489
12	13.172952	12.104534	11.036116	9.967698	8.89928	7.830862	6.762444
13	14.804907	13.736489	12.668071	11.599653	10.531235	9.462817	8.394399
14	16.436862	15.368444	14.300026	13.231608	12.16319	11.094772	10.026354
15	18.068817	17.000399	15.931981	14.863563	13.795145	12.726727	11.658309
16	19.700772	18.632354	17.563936	16.495518	15.4271	14.358682	13.290264
17	21.332727	20.264309	19.195891	18.127473	17.059055	15.990637	14.922219

alpha mu table #1

n horizontal , m vertical

$a := -1.068418$ $n := 0, 1 .. 25$

alpha/2 vs mu/2

$b := 1.631955$ $m := 0, 1 .. 17$

$K_{m,n} := n \cdot a + m \cdot b$

$K =$

	12	13	14	15	16	17	18
0	-12.821016	-13.889434	-14.957852	-16.02627	-17.094688	-18.163106	-19.231524
1	-11.189061	-12.257479	-13.325897	-14.394315	-15.462733	-16.531151	-17.599569
2	-9.557106	-10.625524	-11.693942	-12.76236	-13.830778	-14.899196	-15.967614
3	-7.925151	-8.993569	-10.061987	-11.130405	-12.198823	-13.267241	-14.335659
4	-6.293196	-7.361614	-8.430032	-9.49845	-10.566868	-11.635286	-12.703704
5	-4.661241	-5.729659	-6.798077	-7.866495	-8.934913	-10.003331	-11.071749
6	-3.029286	-4.097704	-5.166122	-6.23454	-7.302958	-8.371376	-9.439794
7	-1.397331	-2.465749	-3.534167	-4.602585	-5.671003	-6.739421	-7.807839
8	0.234624	-0.833794	-1.902212	-2.97063	-4.039048	-5.107466	-6.175884
9	1.866579	0.798161	-0.270257	-1.338675	-2.407093	-3.475511	-4.543929
10	3.498534	2.430116	1.361698	0.29328	-0.775138	-1.843556	-2.911974
11	5.130489	4.062071	2.993653	1.925235	0.856817	-0.211601	-1.280019
12	6.762444	5.694026	4.625608	3.55719	2.488772	1.420354	0.351936
13	8.394399	7.325981	6.257563	5.189145	4.120727	3.052309	1.983891
14	10.026354	8.957936	7.889518	6.8211	5.752682	4.684264	3.615846
15	11.658309	10.589891	9.521473	8.453055	7.384637	6.316219	5.247801
16	13.290264	12.221846	11.153428	10.08501	9.016592	7.948174	6.879756
17	14.922219	13.853801	12.785383	11.716965	10.648547	9.580129	8.511711

alpha mu table #1

n horizontal , m vertical

$a := -1.068418$ $n := 0, 1 .. 30$

alpha/2 vs mu/2

$b := 1.631955$ $m := 0, 1 .. 17$

$K_{m,n} := n \cdot a + m \cdot b$

$\mu/2$ $\alpha = 11$ $\alpha = \frac{23}{2}$

$\mu = \frac{3}{2}$

$K =$

	18	19	20	21	22	23
0	-19.231524	-20.299942	-21.36836	-22.436778	-23.505196	-24.573614
1	-17.599569	-18.667987	-19.736405	-20.804823	-21.873241	-22.941659
2	-15.967614	-17.036032	-18.10445	-19.172868	-20.241286	-21.309704
3	-14.335659	-15.404077	-16.472495	-17.540913	-18.609331	-19.677749
4	-12.703704	-13.772122	-14.84054	-15.908958	-16.977376	-18.045794
5	-11.071749	-12.140167	-13.208585	-14.277003	-15.345421	-16.413839
6	-9.439794	-10.508212	-11.57663	-12.645048	-13.713466	-14.781884
7	-7.807839	-8.876257	-9.944675	-11.013093	-12.081511	-13.149929
8	-6.175884	-7.244302	-8.31272	-9.381138	-10.449556	-11.517974
9	-4.543929	-5.612347	-6.680765	-7.749183	-8.817601	-9.886019
10	-2.911974	-3.980392	-5.04881	-6.117228	-7.185646	-8.254064
11	-1.280019	-2.348437	-3.416855	-4.485273	-5.553691	-6.622109
12	0.351936	-0.716482	-1.7849	-2.853318	-3.921736	-4.990154
13	1.983891	0.915473	-0.152945	-1.221363	-2.289781	-3.358199
14	3.615846	2.547428	1.47901	0.410592	-0.657826	-1.726244
15	5.247801	4.179383	3.110965	2.042547	0.974129	-0.094289
16	6.879756	5.811338	4.74292	3.674502	2.606084	1.537666
17	8.511711	7.443293	6.374875	5.306457	4.238039	3.169621

alpha mu table #1

n horizontal , m vertical

$a := -1.068418$ $n := 0, 1 .. 33$

alpha/2 vs mu/2

$b := 1.631955$ $m := 0, 1 .. 17$

$K_{m,n} := n \cdot a + m \cdot b$

$K =$

	23	24	25	26	27	28	29
0	-24.573614	-25.642032	-26.71045	-27.778868	-28.847286	-29.915704	-30.984122
1	-22.941659	-24.010077	-25.078495	-26.146913	-27.215331	-28.283749	-29.352167
2	-21.309704	-22.378122	-23.44654	-24.514958	-25.583376	-26.651794	-27.720212
3	-19.677749	-20.746167	-21.814585	-22.883003	-23.951421	-25.019839	-26.088257
4	-18.045794	-19.114212	-20.18263	-21.251048	-22.319466	-23.387884	-24.456302
5	-16.413839	-17.482257	-18.550675	-19.619093	-20.687511	-21.755929	-22.824347
6	-14.781884	-15.850302	-16.91872	-17.987138	-19.055556	-20.123974	-21.192392
7	-13.149929	-14.218347	-15.286765	-16.355183	-17.423601	-18.492019	-19.560437
8	-11.517974	-12.586392	-13.65481	-14.723228	-15.791646	-16.860064	-17.928482
9	-9.886019	-10.954437	-12.022855	-13.091273	-14.159691	-15.228109	-16.296527
10	-8.254064	-9.322482	-10.3909	-11.459318	-12.527736	-13.596154	-14.664572
11	-6.622109	-7.690527	-8.758945	-9.827363	-10.895781	-11.964199	-13.032617
12	-4.990154	-6.058572	-7.12699	-8.195408	-9.263826	-10.332244	-11.400662
13	-3.358199	-4.426617	-5.495035	-6.563453	-7.631871	-8.700289	-9.768707
14	-1.726244	-2.794662	-3.86308	-4.931498	-5.999916	-7.068334	-8.136752
15	-0.094289	-1.162707	-2.231125	-3.299543	-4.367961	-5.436379	-6.504797
16	1.537666	0.469248	-0.59917	-1.667588	-2.736006	-3.804424	-4.872842
17	3.169621	2.101203	1.032785	-0.035633	-1.104051	-2.172469	-3.240887

alpha mu table #1

n horizontal , m vertical

$a := -1.068418$ $n := 0, 1 .. 35$

alpha/2 vs mu/2

$b := 1.631955$ $m := 0, 1 .. 17$

$K_{m,n} := n \cdot a + m \cdot b$

$K =$

	29	30	31	32	33	34	35
0	-30.984122	-32.05254	-33.120958	-34.189376	-35.257794	-36.326212	-37.39463
1	-29.352167	-30.420585	-31.489003	-32.557421	-33.625839	-34.694257	-35.762675
2	-27.720212	-28.78863	-29.857048	-30.925466	-31.993884	-33.062302	-34.13072
3	-26.088257	-27.156675	-28.225093	-29.293511	-30.361929	-31.430347	-32.498765
4	-24.456302	-25.52472	-26.593138	-27.661556	-28.729974	-29.798392	-30.86681
5	-22.824347	-23.892765	-24.961183	-26.029601	-27.098019	-28.166437	-29.234855
6	-21.192392	-22.26081	-23.329228	-24.397646	-25.466064	-26.534482	-27.6029
7	-19.560437	-20.628855	-21.697273	-22.765691	-23.834109	-24.902527	-25.970945
8	-17.928482	-18.9969	-20.065318	-21.133736	-22.202154	-23.270572	-24.33899
9	-16.296527	-17.364945	-18.433363	-19.501781	-20.570199	-21.638617	-22.707035
10	-14.664572	-15.73299	-16.801408	-17.869826	-18.938244	-20.006662	-21.07508
11	-13.032617	-14.101035	-15.169453	-16.237871	-17.306289	-18.374707	-19.443125
12	-11.400662	-12.46908	-13.537498	-14.605916	-15.674334	-16.742752	-17.81117
13	-9.768707	-10.837125	-11.905543	-12.973961	-14.042379	-15.110797	-16.179215
14	-8.136752	-9.20517	-10.273588	-11.342006	-12.410424	-13.478842	-14.54726
15	-6.504797	-7.573215	-8.641633	-9.710051	-10.778469	-11.846887	-12.915305
16	-4.872842	-5.94126	-7.009678	-8.078096	-9.146514	-10.214932	-11.28335
17	-3.240887	-4.309305	-5.377723	-6.446141	-7.514559	-8.582977	-9.651395

alpha mu table #2

m and n of opposite sign

n horizontal , m vertical

$a := -2.136835$ $n := 0, 1 .. 25$

$b := 3.263909$ $m := 0, 1 .. 17$

$K_{m,n} := -n \cdot a + m \cdot b$

$\mu^m \cdot \alpha^n$ $n = 0 .. -25$

α

μ

K =

	0	- 1	- 2	- 3	- 4	- 5	- 6
0	0	2.136835	4.27367	6.410505	8.54734	10.684175	12.82101
1	3.263909	5.400744	7.537579	9.674414	11.811249	13.948084	16.084919
2	6.527818	8.664653	10.801488	12.938323	15.075158	17.211993	19.348828
3	9.791727	11.928562	14.065397	16.202232	18.339067	20.475902	22.612737
4	13.055636	15.192471	17.329306	19.466141	21.602976	23.739811	25.876646
5	16.319545	18.45638	20.593215	22.73005	24.866885	27.00372	29.140555
6	19.583454	21.720289	23.857124	25.993959	28.130794	30.267629	32.404464
7	22.847363	24.984198	27.121033	29.257868	31.394703	33.531538	35.668373
8	26.111272	28.248107	30.384942	32.521777	34.658612	36.795447	38.932282
9	29.375181	31.512016	33.648851	35.785686	37.922521	40.059356	42.196191
10	32.63909	34.775925	36.91276	39.049595	41.18643	43.323265	45.4601
11	35.902999	38.039834	40.176669	42.313504	44.450339	46.587174	48.724009
12	39.166908	41.303743	43.440578	45.577413	47.714248	49.851083	51.987918
13	42.430817	44.567652	46.704487	48.841322	50.978157	53.114992	55.251827
14	45.694726	47.831561	49.968396	52.105231	54.242066	56.378901	58.515736
15	48.958635	51.09547	53.232305	55.36914	57.505975	59.64281	61.779645
16	52.222544	54.359379	56.496214	58.633049	60.769884	62.906719	65.043554
17	55.486453	57.623288	59.760123	61.896958	64.033793	66.170628	68.307463

alpha mu table #2

n horizontal , m vertical

$a := -2.136835$ $n := 0, 1 .. 25$

$b := 3.263909$ $m := 0, 1 .. 17$

$K_{m,n} := -n \cdot a + m \cdot b$

$\alpha^n \cdot \mu^m$ $n = -1 \ldots -25$

α

		−6	−7	−8	−9	−10	−11	−12
	0	12.82101	14.957845	17.09468	19.231515	21.36835	23.505185	25.64202
	1	16.084919	18.221754	20.358589	22.495424	24.632259	26.769094	28.905929
	2	19.348828	21.485663	23.622498	25.759333	27.896168	30.033003	32.169838
	3	22.612737	24.749572	26.886407	29.023242	31.160077	33.296912	35.433747
	4	25.876646	28.013481	30.150316	32.287151	34.423986	36.560821	38.697656
	5	29.140555	31.27739	33.414225	35.55106	37.687895	39.82473	41.961565
	6	32.404464	34.541299	36.678134	38.814969	40.951804	43.088639	45.225474
μ	7	35.668373	37.805208	39.942043	42.078878	44.215713	46.352548	48.489383
K =	8	38.932282	41.069117	43.205952	45.342787	47.479622	49.616457	51.753292
	9	42.196191	44.333026	46.469861	48.606696	50.743531	52.880366	55.017201
	10	45.4601	47.596935	49.73377	51.870605	54.00744	56.144275	58.28111
	11	48.724009	50.860844	52.997679	55.134514	57.271349	59.408184	61.545019
	12	51.987918	54.124753	56.261588	58.398423	60.535258	62.672093	64.808928
	13	55.251827	57.388662	59.525497	61.662332	63.799167	65.936002	68.072837
	14	58.515736	60.652571	62.789406	64.926241	67.063076	69.199911	71.336746
	15	61.779645	63.91648	66.053315	68.19015	70.326985	72.46382	74.600655
	16	65.043554	67.180389	69.317224	71.454059	73.590894	75.727729	77.864564
	17	68.307463	70.444298	72.581133	74.717968	76.854803	78.991638	81.128473

alpha mu table #2

n horizontal , m vertical

$a := -2.136835$ $n := 0, 1 .. 25$

$b := 3.263909$ $m := 0, 1 .. 17$

$K_{m,n} := -n \cdot a + m \cdot b$

$\alpha^n \mu^m$ $n = -1 \cdots -25$

α

		-12	-13	-14	-15	-16	-17	-18
	0	25.64202	27.778855	29.91569	32.052525	34.18936	36.326195	38.46303
	1	28.905929	31.042764	33.179599	35.316434	37.453269	39.590104	41.726939
	2	32.169838	34.306673	36.443508	38.580343	40.717178	42.854013	44.990848
	3	35.433747	37.570582	39.707417	41.844252	43.981087	46.117922	48.254757
	4	38.697656	40.834491	42.971326	45.108161	47.244996	49.381831	51.518666
μ	5	41.961565	44.0984	46.235235	48.37207	50.508905	52.64574	54.782575
	6	45.225474	47.362309	49.499144	51.635979	53.772814	55.909649	58.046484
	7	48.489383	50.626218	52.763053	54.899888	57.036723	59.173558	61.310393
K =	8	51.753292	53.890127	56.026962	58.163797	60.300632	62.437467	64.574302
	9	55.017201	57.154036	59.290871	61.427706	63.564541	65.701376	67.838211
	10	58.28111	60.417945	62.55478	64.691615	66.82845	68.965285	71.10212
	11	61.545019	63.681854	65.818689	67.955524	70.092359	72.229194	74.366029
	12	64.808928	66.945763	69.082598	71.219433	73.356268	75.493103	77.629938
	13	68.072837	70.209672	72.346507	74.483342	76.620177	78.757012	80.893847
	14	71.336746	73.473581	75.610416	77.747251	79.884086	82.020921	84.157756
	15	74.600655	76.73749	78.874325	81.01116	83.147995	85.28483	87.421665
	16	77.864564	80.001399	82.138234	84.275069	86.411904	88.548739	90.685574
	17	81.128473	83.265308	85.402143	87.538978	89.675813	91.812648	93.949483

alpha mu table #2

n horizontal , m vertical

$a := -2.136835$ $n := 0, 1 .. 25$

$b := 3.263909$ $m := 0, 1 .. 17$

$K_{m,n} := -n \cdot a + m \cdot b$

		-18	-19	-20	-21	-22	-23	-24
	0	38.46303	40.599865	42.7367	44.873535	47.01037	49.147205	51.28404
	1	41.726939	43.863774	46.000609	48.137444	50.274279	52.411114	54.547949
	2	44.990848	47.127683	49.264518	51.401353	53.538188	55.675023	57.811858
	3	48.254757	50.391592	52.528427	54.665262	56.802097	58.938932	61.075767
	4	51.518666	53.655501	55.792336	57.929171	60.066006	62.202841	64.339676
	5	54.782575	56.91941	59.056245	61.19308	63.329915	65.46675	67.603585
	6	58.046484	60.183319	62.320154	64.456989	66.593824	68.730659	70.867494
	7	61.310393	63.447228	65.584063	67.720898	69.857733	71.994568	74.131403
K =	8	64.574302	66.711137	68.847972	70.984807	73.121642	75.258477	77.395312
	9	67.838211	69.975046	72.111881	74.248716	76.385551	78.522386	80.659221
	10	71.10212	73.238955	75.37579	77.512625	79.64946	81.786295	83.92313
	11	74.366029	76.502864	78.639699	80.776534	82.913369	85.050204	87.187039
	12	77.629938	79.766773	81.903608	84.040443	86.177278	88.314113	90.450948
	13	80.893847	83.030682	85.167517	87.304352	89.441187	91.578022	93.714857
	14	84.157756	86.294591	88.431426	90.568261	92.705096	94.841931	96.978766
	15	87.421665	89.5585	91.695335	93.83217	95.969005	98.10584	100.242675
	16	90.685574	92.822409	94.959244	97.096079	99.232914	101.369749	103.506584
	17	93.949483	96.086318	98.223153	100.359988	102.496823	104.633658	106.770493

TABLE OF VALUES OF $N^x \mu^y$

$N = \sqrt{S}$, where S is the ratio of coulomb to gravitational force;
and μ is the ratio of baryon mass to electron mass.
All entries are $\log_{10}$ of cgs values.

	μ^{-3}	μ^{-2}	μ^{-1}	μ^0	μ	μ^2	μ^3
N^4	68.920033	72.183942	75.447851	78.711760	81.975669	85.239578	88.503487
N^3	49.242093	52.506002	55.769911	59.033820	62.297729	65.561638	68.825547
N^2	29.564153	32.828062	36.091971	39.355880	42.689789	45.883698	49.147607
N	9.886213	13.150122	16.414031	19.677940	22.941849	26.205758	29.469667
N^0	-9.791727	-6.527818	-3.263909	0	3.263909	6.527818	9.791727
N^{-1}	-29.469667	-26.205758	-22.941849	-19.677940	-16.414031	-13.150122	-9.886213
N^{-2}	-49.147607	-45.883698	-42.689789	-39.355880	-36.091971	-32.828062	-29.564153
N^{-3}	-68.825547	-65.561638	-62.297729	-59.033820	-55.769911	-52.506002	-49.242093
N^{-4}	-88.503487	-85.239578	-81.975669	-78.711760	-75.447851	-72.183942.	-68.920033

GEOME INPUTS NUMBER ONE a IS mo, b IS mp

$a := -4.662403798 \approx m_o$ $b := -23.776602304 \approx m_p$

$n := 0, 1 .. 18$ $k := 0, 1 .. 16$

$J_n := n \cdot \left(\frac{a}{2}\right)$ $K_k := k \cdot \left(\frac{b}{2}\right)$

J =

	0
0	0
1	-2.331201899
2	-4.662403798
3	-6.993605697
4	-9.324807596
5	-11.656009495
6	-13.987211394
7	-16.318413293
8	-18.649615192
9	-20.980817091
10	-23.31201899
11	-25.643220889
12	-27.974422788
13	-30.305624687
14	-32.636826586
15	-34.968028485
16	-37.299230384
17	-39.630432283
18	-41.961634182

K =

	0
0	0
1	-11.888301152
2	-23.776602304
3	-35.664903456
4	-47.553204608
5	-59.44150576
6	-71.329806912
7	-83.218108064
8	-95.106409216
9	-106.994710368
10	-118.88301152
11	-130.771312672
12	-142.659613824
13	-154.547914976
14	-166.436216128
15	-178.32451728
16	-190.212818432

$\sqrt{\frac{m_o^5}{m_p}} = 0.232291$

$10 \times \frac{m_o}{2} \doteq m_p$ $\frac{\Delta}{2} = 0.232292$

$\Delta 2.4645 83$

PROTON ELECTRON MASSES

$a := 3.263908788$ μ

$r := -23.776602304$ m_p

$n := 1, 2 .. 15$ $m := 0, 1 .. 18$

$J_n := n \cdot a$

$J =$

	0
0	0
1	3.263908788
2	6.527817576
3	9.791726364
4	13.055635152
5	16.31954394
6	19.583452728
7	22.847361516
8	26.111270304
9	29.375179092
10	32.63908788
11	35.902996668
12	39.166905456
13	42.430814244
14	45.694723032
15	48.95863182

$H_m := m \cdot a + r$

$H =$

	0
0	-23.776602304
1	-20.512693516
2	-17.248784728
3	-13.98487594
4	-10.720967152
5	-7.457058364
6	-4.193149576
7	-0.929240788
8	2.334668
9	5.598576788
10	8.862485576
11	12.126394364
12	15.390303152
13	18.65421194
14	21.918120728
15	25.182029516
16	28.445938304
17	31.709847092
18	34.97375588

$G_m := r - m \cdot a$

$G =$

	0
0	-23.776602304
1	-27.040511092
2	-30.30441988
3	-33.568328668
4	-36.832237456
5	-40.096146244
6	-43.360055032
7	-46.62396382
8	-49.887872608
9	-53.151781396
10	-56.415690184
11	-59.679598972
12	-62.94350776
13	-66.207416548
14	-69.471325336
15	-72.735234124
16	-75.999142912
17	-79.2630517
18	-82.526960488

COMPTON

COMPTON WAVE LENGTH, BOHR RADIUS

$a := -2.136834673$ = α = fine structure constant [0]

$r := -12.550068214$ = r_e = electron radius [L]

$n := 1, 2 .. 15$ $\quad J_n := n \cdot a$

$m := 0, 1 .. 18$ $\quad H_m := m \cdot a + r$ $\quad G_m := r - m \cdot a$

$J =$

	0
0	0
1	-2.136834673
2	-4.273669346
3	-6.410504019
4	-8.547338692
5	-10.684173365
6	-12.821008038
7	-14.957842711
8	-17.094677384
9	-19.231512057
10	-21.36834673
11	-23.505181403
12	-25.642016076
13	-27.778850749
14	-29.915685422
15	-32.052520095

$H =$

	0
0	-12.550068214
1	-14.686902887
2	-16.82373756
3	-18.960572233
4	-21.097406906
5	-23.234241579
6	-25.371076252
7	-27.507910925
8	-29.644745598
9	-31.781580271
10	-33.918414944
11	-36.055249617
12	-38.19208429
13	-40.328918963
14	-42.465753636
15	-44.602588309
16	-46.739422982
17	-48.876257655
18	-51.013092328

$G =$

	0	
0	-12.550068214	- electron radius
1	-10.413233541	
2	-8.276398868	- Bohr Radius
3	-6.139564195	
4	-4.002729522	
5	-1.865894849	
6	0.270939824	
7	2.407774497	
8	4.54460917	
9	6.681443843	
10	8.818278516	
11	10.955113189	
12	13.091947862	
13	15.228782535	
14	17.365617208	
15	19.502451881	
16	21.639286554	
17	23.776121227	- Note
18	25.9129559	

$r_e - 17\alpha \doteq -m_p$

[4] [M]

COMPTON2

$a := -2.136834673$ fine structure constant

$r := -12.550068214$ electron radius

$s := r + 15 \cdot a$

$q := r - 15 \cdot a$

$m := 0, 1 .. 18$

$H_m := m \cdot a + s$

$G_m := q - m \cdot a$

$H =$

	0
0	-44.602588309
1	-46.739422982
2	-48.876257655
3	-51.013092328
4	-53.149927001
5	-55.286761674
6	-57.423596347
7	-59.56043102
8	-61.697265693
9	-63.834100366
10	-65.970935039
11	-68.107769712
12	-70.244604385
13	-72.381439058
14	-74.518273731
15	-76.655108404
16	-78.791943077
17	-80.92877775
18	-83.065612423

$G =$

	0
0	19.502451881
1	21.639286554
2	23.776121227
3	25.9129559
4	28.049790573
5	30.186625246
6	32.323459919
7	34.460294592
8	36.597129265
9	38.733963938
10	40.870798611
11	43.007633284
12	45.144467957
13	47.28130263
14	49.418137303
15	51.554971976
16	53.691806649
17	55.828641322
18	57.965475995

- cf L_υ

GEOME7 PLANCK MASS--PROTON MASS ARRAY

$a := -4.662403798$ $b := -23.776602304$ $\mu := 3.263908787$

$n := 0, 1 .. 18$

$g := \frac{(a-b)}{4}$ $g = 4.778549627$ $k := 24.008893961$ $q := 33.565993214$ $s := 42.525773764$

$J_n := b + n \cdot g - \mu$ $K_n := k + n \cdot \left(\frac{g}{8}\right) - \mu$ $Q_n := q + n \cdot \left(\frac{g}{8}\right) - \mu$ $S_n := s + n \cdot \left(\frac{g}{8}\right) - \mu$

J =

	0
0	-27.040511091
1	-22.261961464
2	-17.483411838
3	-12.704862212
4	-7.926312585
5	-3.147762958
6	1.630786668
7	6.409336294
8	11.187885921
9	15.966435548
10	20.744985174
11	25.523534801
12	30.302084427
13	35.080634054
14	39.85918368
15	44.637733307
16	49.416282933
17	54.19483256
18	58.973382186

K =

	0
0	20.744985174
1	21.342303877
2	21.939622581
3	22.536941284
4	23.134259987
5	23.731578691
6	24.328897394
7	24.926216097
8	25.523534801
9	26.120853504
10	26.718172207
11	27.31549091
12	27.912809614
13	28.510128317
14	29.10744702
15	29.704765724
16	30.302084427
17	30.89940313
18	31.496721834

Q =

	0
0	30.302084427
1	30.89940313
2	31.496721834
3	32.094040537
4	32.69135924
5	33.288677944
6	33.885996647
7	34.48331535
8	35.080634054
9	35.677952757
10	36.27527146
11	36.872590163
12	37.469908867
13	38.06722757
14	38.664546273
15	39.261864977
16	39.85918368
17	40.456502383
18	41.053821087

S =

	0
0	39.261864977
1	39.85918368
2	40.456502384
3	41.053821087
4	41.65113979
5	42.248458494
6	42.845777197
7	43.4430959
8	44.040414604
9	44.637733307
10	45.23505201
11	45.832370713
12	46.429689417
13	47.02700812
14	47.624326823
15	48.221645527
16	48.81896423
17	49.416282933
18	50.013601637

GEOME7 PLANCK MASS--PROTON MASS ARRAY

$a := -4.662403798$ $b := -23.776602304$

$n := 0, 1 .. 18$

$g := \frac{(a-b)}{4}$ $g = 4.778549627$ $k := 24.008893961$ $q := 33.565993214$ $s := 42.525773764$

$J_n := b + n \cdot g$ $K_n := k + n \cdot \left(\frac{g}{8}\right)$ $Q_n := q + n \cdot \left(\frac{g}{8}\right)$ $S_n := s + n \cdot \left(\frac{g}{8}\right)$

$J =$

	0
0	-23.776602304
1	-18.998052677
2	-14.219503051
3	-9.440953424
4	-4.662403798
5	0.116145829
6	4.894695455
7	9.673245081
8	14.451794708
9	19.230344335
10	24.008893961
11	28.787443588
12	33.565993214
13	38.344542841
14	43.123092467
15	47.901642094
16	52.68019172
17	57.458741346
18	62.237290973

$K =$

	0
0	24.008893961
1	24.606212664
2	25.203531368
3	25.800850071
4	26.398168774
5	26.995487478
6	27.592806181
7	28.190124884
8	28.787443588
9	29.384762291
10	29.982080994
11	30.579399697
12	31.176718401
13	31.774037104
14	32.371355807
15	32.968674511
16	33.565993214
17	34.163311917
18	34.760630621

$Q =$

	0
0	33.565993214
1	34.163311917
2	34.760630621
3	35.357949324
4	35.955268027
5	36.552586731
6	37.149905434
7	37.747224137
8	38.344542841
9	38.941861544
10	39.539180247
11	40.13649895
12	40.733817654
13	41.331136357
14	41.92845506
15	42.525773764
16	43.123092467
17	43.72041117
18	44.317729874

$S =$

	0
0	42.525773764
1	43.123092467
2	43.720411171
3	44.317729874
4	44.915048577
5	45.512367281
6	46.109685984
7	46.707004687
8	47.304323391
9	47.901642094
10	48.498960797
11	49.0962795
12	49.693598204
13	50.290916907
14	50.88823561
15	51.485554314
16	52.082873017
17	52.68019172
18	53.277510424

GEOME TWO: PLANCK MASS--PROTON MASS ARRAY

$a := -4.662403798$ $b := -23.776602304$

$n := 0,1..8$ $m := 0,1..8$

$J_{m,n} := m\cdot\left(\frac{a}{2}\right) - n\cdot\left(\frac{b}{2}\right)$

$$J = \begin{bmatrix} 0 & 11.888301 & 23.776602 & 35.664903 & 47.553205 & 59.441506 & 71.329807 & 83.218108 & 95.106409 \\ -2.331202 & 9.557099 & 21.4454 & 33.333702 & 45.222003 & 57.110304 & 68.998605 & 80.886906 & 92.775207 \\ -4.662404 & 7.225897 & 19.114199 & 31.0025 & 42.890801 & 54.779102 & 66.667403 & 78.555704 & 90.444005 \\ -6.993606 & 4.894695 & 16.782997 & 28.671298 & 40.559599 & 52.4479 & 64.336201 & 76.224502 & 88.112804 \\ -9.324808 & 2.563494 & 14.451795 & 26.340096 & 38.228397 & 50.116698 & 62.004999 & 73.8933 & 85.781602 \\ -11.656009 & 0.232292 & 12.120593 & 24.008894 & 35.897195 & 47.785496 & 59.673797 & 71.562099 & 83.4504 \\ -13.987211 & -2.09891 & 9.789391 & 21.677692 & 33.565993 & 45.454294 & 57.342596 & 69.230897 & 81.119198 \\ -16.318413 & -4.430112 & 7.458189 & 19.34649 & 31.234791 & 43.123092 & 55.011394 & 66.899695 & 78.787996 \\ -18.649615 & -6.761314 & 5.126987 & 17.015288 & 28.903589 & 40.791891 & 52.680192 & 64.568493 & 76.456794 \end{bmatrix}$$

$9.557099 = \sqrt{\frac{m_0}{m_p}}$ $\sqrt{\frac{a}{b}}$

ΔU ΔD — $14.219503 = \sqrt{\frac{m_0 m_p}{a\,b}}$

$\sqrt{b}\ \Delta C = \sqrt{m_p}$

$\sqrt{a}\ \Delta R = \sqrt{m_0}$

(A) $= \sqrt{\frac{m_0}{m_p}}$

Δ 9.557099

19.114

9.55^2

all Δ's $\Delta = 14.219503 = \sqrt{m_0 m_p}$ (B)

Δ 0.232292

m_0^2

5 row Δ shift \ collum

8 X 2.331202

~~5 X 0.232292~~

5 X 2.331202

MASS Δ m_0

$D = \sqrt{m_0}$

all ROW Δ's $= 2.331202 = \frac{m_0}{2}$ (D) $2D = -m_0$ $C + D = B$ (A) $+ 2m_0 = 0.232291$

all column Δ's $= 11.888301$ (C) $2C = -m_p$ $C - D = A$ $\sqrt{\frac{m_0^5}{m_p}} = 0.232291$

~~2.331202~~

$C = \sqrt{m_p}$

GEOME2 PLANCK MASS--PROTON MASS ARRAY

$a := -4.662403798$ $b := -23.776602304$

$n := 0, 1 .. 8$ $m := 0, 1 .. 8$

$$J_{m,n} := m \cdot \left(\frac{a}{2}\right) - n \cdot \left(\frac{b}{2}\right)$$

$$J = \begin{bmatrix} 0 & 11.888301 & 23.776602 & 35.664903 & 47.553205 & 59.441506 & 71.329807 & 83.218108 & 95.106409 \\ -2.331202 & 9.557099 & 21.4454 & 33.333702 & 45.222003 & 57.110304 & 68.998605 & 80.886906 & 92.775207 \\ -4.662404 & 7.225897 & 19.114199 & 31.0025 & 42.890801 & 54.779102 & 66.667403 & 78.555704 & 90.444005 \\ -6.993606 & 4.894695 & 16.782997 & 28.671298 & 40.559599 & 52.4479 & 64.336201 & 76.224502 & 88.112804 \\ -9.324808 & 2.563494 & 14.451795 & 26.340096 & 38.228397 & 50.116698 & 62.004999 & 73.8933 & 85.781602 \\ -11.656009 & 0.232292 & 12.120593 & 24.008894 & 35.897195 & 47.785496 & 59.673797 & 71.562099 & 83.4504 \\ -13.987211 & -2.09891 & 9.789391 & 21.677692 & 33.565993 & 45.454294 & 57.342596 & 69.230897 & 81.119198 \\ -16.318413 & -4.430112 & 7.458189 & 19.34649 & 31.234791 & 43.123092 & 55.011394 & 66.899695 & 78.787996 \\ -18.649615 & -6.761314 & 5.126987 & 17.015288 & 28.903589 & 40.791891 & 52.680192 & 64.568493 & 76.456794 \end{bmatrix}$$

GEOME3 PLANCK SIZE--PROTON SIZE ARRAY

$a := -32.791340828$ $b := -12.550068214$

$n := 0, 1 .. 8$ $m := 0, 1 .. 8$

$$J_{m,n} := m \cdot \left(\frac{b}{2}\right) - n \cdot \left(\frac{a}{2}\right)$$

$$J = \begin{bmatrix} 0 & 16.39567 & 32.791341 & 49.187011 & 65.582682 & 81.978352 & 98.374022 & 114.769693 & 131.165363 \\ -6.275034 & 10.120636 & 26.516307 & 42.911977 & 59.307648 & 75.703318 & 92.098988 & 108.494659 & 124.890329 \\ -12.550068 & 3.845602 & 20.241273 & 36.636943 & 53.032613 & 69.428284 & 85.823954 & 102.219625 & 118.615295 \\ -18.825102 & -2.429432 & 13.966239 & 30.361909 & 46.757579 & 63.15325 & 79.54892 & 95.944591 & 112.340261 \\ -25.100136 & -8.704466 & 7.691204 & 24.086875 & 40.482545 & 56.878216 & 73.273886 & 89.669556 & 106.065227 \\ -31.375171 & -14.9795 & 1.41617 & 17.811841 & 34.207511 & 50.603182 & 66.998852 & 83.394522 & 99.790193 \\ -37.650205 & -21.254534 & -4.858864 & 11.536807 & 27.932477 & 44.328147 & 60.723818 & 77.119488 & 93.515159 \\ -43.925239 & -27.529568 & -11.133898 & 5.261772 & 21.657443 & 38.053113 & 54.448784 & 70.844454 & 87.240125 \\ -50.200273 & -33.804602 & -17.408932 & -1.013262 & 15.382409 & 31.778079 & 48.17375 & 64.56942 & 80.96509 \end{bmatrix}$$

GEOME4 PLANCK ML vs PROTON ML ARRAY

$a := -37.453744626$ $\quad = \hbar/c$ $\qquad b := -36.326670518$ $\qquad \frac{b}{a} = d\mu$

$n := 0, 1 .. 8$ $\qquad m := 0, 1 .. 8$

$$J_{m,n} := m \cdot \left(\frac{a}{2}\right) - n \cdot \left(\frac{b}{2}\right)$$

$m_0 l_0$

$$J = \begin{bmatrix} 0 & 18.163335 & 36.326671 & 54.490006 & 72.653341 & 90.816676 & 108.980012 & 127.143347 & 145.306682 \\ -18.726872 & -0.563537 & 17.599798 & 35.763133 & 53.926469 & 72.089804 & 90.253139 & 108.416474 & 126.57981 \\ -37.453745 & -19.290409 & -1.127074 & 17.036261 & 35.199596 & 53.362932 & 71.526267 & 89.689602 & 107.852937 \\ -56.180617 & -38.017282 & -19.853946 & -1.690611 & 16.472724 & 34.636059 & 52.799395 & 70.96273 & 89.126065 \\ -74.907489 & -56.744154 & -38.580819 & -20.417483 & -2.254148 & 15.909187 & 34.072522 & 52.235858 & 70.399193 \\ -93.634362 & -75.471026 & -57.307691 & -39.144356 & -20.981021 & -2.817685 & 15.34565 & 33.508985 & 51.672321 \\ -112.361234 & -94.197899 & -76.034563 & -57.871228 & -39.707893 & -21.544558 & -3.381222 & 14.782113 & 32.945448 \\ -131.088106 & -112.924771 & -94.761436 & -76.5981 & -58.434765 & -40.27143 & -22.108095 & -3.944759 & 14.218576 \\ -149.814979 & -131.651643 & -113.488308 & -95.324973 & -77.161637 & -58.998302 & -40.834967 & -22.671632 & -4.508296 \end{bmatrix}$$

GEOME5 PLANCK M/L vs PROTON M/L ARRAY

PLANCK	PROTON	
$a := 28.128937030$	$b := -11.226534090$	$\frac{a}{b} = S$
$= C^3/G$		
$n := 0, 1 .. 8$	$m := 0, 1 .. 8$	

$$J_{m,n} := m \cdot \left(\frac{a}{2}\right) - n \cdot \left(\frac{b}{2}\right)$$

$$J = \begin{bmatrix} 0 & 5.613267 & 11.226534 & 16.839801 & 22.453068 & 28.066335 & 33.679602 & 39.292869 & 44.906136 \\ 14.064469 & 19.677736 & 25.291003 & 30.90427 & 36.517537 & 42.130804 & 47.744071 & 53.357338 & 58.970605 \\ 28.128937 & 33.742204 & 39.355471 & 44.968738 & 50.582005 & 56.195272 & 61.808539 & 67.421806 & 73.035073 \\ 42.193406 & 47.806673 & 53.41994 & 59.033207 & 64.646474 & 70.259741 & 75.873008 & 81.486275 & 87.099542 \\ 56.257874 & 61.871141 & 67.484408 & 73.097675 & 78.710942 & 84.324209 & 89.937476 & 95.550743 & 101.16401 \\ 70.322343 & 75.93561 & 81.548877 & 87.162144 & 92.775411 & 98.388678 & 104.001945 & 109.615212 & 115.228479 \\ 84.386811 & 90.000078 & 95.613345 & 101.226612 & 106.839879 & 112.453146 & 118.066413 & 123.67968 & 129.292947 \\ 98.45128 & 104.064547 & 109.677814 & 115.291081 & 120.904348 & 126.517615 & 132.130882 & 137.744149 & 143.357416 \\ 112.515748 & 118.129015 & 123.742282 & 129.355549 & 134.968816 & 140.582083 & 146.19535 & 151.808617 & 157.421884 \end{bmatrix}$$

$\sqrt{a} = 14.064469$

$5.613267 = \Delta$ ROW $= \sqrt{\frac{m_p}{l_p}}$

$\sqrt{b} = 5.613267 = \Delta$ Column $= \sqrt{\frac{m_p}{l_e}}$

Δ — $\sqrt{S} = \sqrt{\frac{a}{b}} = 19.677735$

Δ — $\sqrt{a \cdot b} = 8.451202$

GEOME THREE: PLANCK SIZE vs PROTON SIZE ARRAY

$a := -32.791340828$ $b := -12.550068214$

$n := 0, 1 .. 8$ $m := 0, 1 .. 8$

$-2, -1 .. 6$

$$J_{m,n} := m \cdot \left(\frac{b}{2}\right) - n \cdot \left(\frac{a}{2}\right)$$

$$J = \begin{bmatrix} 0 & 16.39567 & 32.79134 & 49.187011 & 65.582682 & 81.978352 & 98.374022 & 114.769693 & 131.165363 \\ -6.275034 & 10.120636 & 26.516307 & 42.911977 & 59.307648 & 75.703318 & 92.098988 & 108.494659 & 124.890329 \\ -12.550068 & 3.845602 & 20.241273 & 36.636943 & 53.032613 & 69.428284 & 85.823954 & 102.219625 & 118.615295 \\ -18.825102 & -2.429432 & 13.966239 & 30.361909 & 46.757579 & 63.15325 & 79.54892 & 95.944591 & 112.340261 \\ -25.100136 & -8.704466 & 7.691204 & 24.086875 & 40.482545 & 56.878216 & 73.273886 & 89.669556 & 106.065227 \\ -31.375171 & -14.9795 & 1.41617 & 17.811841 & 34.207511 & 50.603182 & 66.998852 & 83.394522 & 99.790193 \\ -37.650205 & -21.254534 & -4.858864 & 11.536807 & 27.932477 & 44.328147 & 60.723818 & 77.119488 & 93.515159 \\ -43.925239 & -27.529568 & -11.133898 & 5.261772 & 21.657443 & 38.053113 & 54.448784 & 70.844454 & 87.240125 \\ -50.200273 & -33.804602 & -17.408932 & -1.013262 & 15.382409 & 31.778079 & 48.17375 & 64.56942 & 80.96509 \end{bmatrix}$$

$\Delta U = \sqrt{\frac{re}{lo}} = 10.120637$ $\sqrt{\frac{a}{b}}$

$\Delta R \sqrt{re}$ $\Delta C \sqrt{lo}$

$\Delta D \sqrt{re\,lo} = 22.670704$ $\sqrt{a \cdot b}$

A $\sqrt{\frac{re}{lo}} = 10.120637$

$\frac{\sqrt{re^5}}{lo} = 1.41617$

Column $\Delta = 16.395671 = \sqrt{lo}$ $\sqrt{re}$

row $\Delta = 6.275034 = \sqrt{re}$ $\sqrt{b}$

$(\alpha\mu s)^x$ $B = \sqrt{re\,lo}$ $(\alpha\mu s)^y$

22.670704

11.335352

GEOME2 PLANCK MASS--PROTON MASS ARRAY

$a := -4.662403798$ $b := -23.776602304$

$n := 0, 1 .. 8$ $m := 0, 1 .. 8$

$$J_{m,n} := m \cdot \left(\frac{a}{2}\right) - n \cdot \left(\frac{b}{2}\right)$$

$$J = \begin{bmatrix} 0 & 11.888301 & 23.776602 & 35.664903 & 47.553205 & 59.441506 & 71.329807 & 83.218108 & 95.106409 \\ -2.331202 & 9.557099 & 21.4454 & 33.333702 & 45.222003 & 57.110304 & 68.998605 & 80.886906 & 92.775207 \\ -4.662404 & 7.225897 & 19.114199 & 31.0025 & 42.890801 & 54.779102 & 66.667403 & 78.555704 & 90.444005 \\ -6.993606 & 4.894695 & 16.782997 & 28.671298 & 40.559599 & 52.4479 & 64.336201 & 76.224502 & 88.112804 \\ -9.324808 & 2.563494 & 14.451795 & 26.340096 & 38.228397 & 50.116698 & 62.004999 & 73.8933 & 85.781602 \\ -11.656009 & 0.232292 & 12.120593 & 24.008894 & 35.897195 & 47.785496 & 59.673797 & 71.562099 & 83.4504 \\ -13.987211 & -2.09891 & 9.789391 & 21.677692 & 33.565993 & 45.454294 & 57.342596 & 69.230897 & 81.119198 \\ -16.318413 & -4.430112 & 7.458189 & 19.34649 & 31.234791 & 43.123092 & 55.011394 & 66.899695 & 78.787996 \\ -18.649615 & -6.761314 & 5.126987 & 17.015288 & 28.903589 & 40.791891 & 52.680192 & 64.568493 & 76.456794 \end{bmatrix}$$

GEOME3 PLANCK SIZE--PROTON SIZE ARRAY

$a := -32.791340828$ $b := -12.550068214$

$n := 0, 1 .. 8$ $m := 0, 1 .. 8$

$$J_{m,n} := m \cdot \left(\frac{b}{2}\right) - n \cdot \left(\frac{a}{2}\right)$$

$$J = \begin{bmatrix} 0 & 16.39567 & 32.791341 & 49.187011 & 65.582682 & 81.978352 & 98.374022 & 114.769693 & 131.165363 \\ -6.275034 & 10.120636 & 26.516307 & 42.911977 & 59.307648 & 75.703318 & 92.098988 & 108.494659 & 124.890329 \\ -12.550068 & 3.845602 & 20.241273 & 36.636943 & 53.032613 & 69.428284 & 85.823954 & 102.219625 & 118.615295 \\ -18.825102 & -2.429432 & 13.966239 & 30.361909 & 46.757579 & 63.15325 & 79.54892 & 95.944591 & 112.340261 \\ -25.100136 & -8.704466 & 7.691204 & 24.086875 & 40.482545 & 56.878216 & 73.273886 & 89.669556 & 106.065227 \\ -31.375171 & -14.9795 & 1.41617 & 17.811841 & 34.207511 & 50.603182 & 66.998852 & 83.394522 & 99.790193 \\ -37.650205 & -21.254534 & -4.858864 & 11.536807 & 27.932477 & 44.328147 & 60.723818 & 77.119488 & 93.515159 \\ -43.925239 & -27.529568 & -11.133898 & 5.261772 & 21.657443 & 38.053113 & 54.448784 & 70.844454 & 87.240125 \\ -50.200273 & -33.804602 & -17.408932 & -1.013262 & 15.382409 & 31.778079 & 48.17375 & 64.56942 & 80.96509 \end{bmatrix}$$

GEOME4 PLANCK ML vs PROTON ML ARRAY

PLANCK	PROTON
$a := -37.453744626$	$b := -36.326670518$
$n := 0,1..8$	$m := 0,1..8$

$$J_{m,n} := m \cdot \left(\frac{a}{2}\right) - n \cdot \left(\frac{b}{2}\right)$$

$$J = \begin{bmatrix} 0 & 18.163335 & 36.326671 & 54.490006 & 72.653341 & 90.816676 & 108.980012 & 127.143347 & 145.306682 \\ -18.726872 & -0.563537 & 17.599798 & 35.763133 & 53.926469 & 72.089804 & 90.253139 & 108.416474 & 126.57981 \\ -37.453745 & -19.290409 & -1.127074 & 17.036261 & 35.199596 & 53.362932 & 71.526267 & 89.689602 & 107.852937 \\ -56.180617 & -38.017282 & -19.853946 & -1.690611 & 16.472724 & 34.636059 & 52.799395 & 70.96273 & 89.126065 \\ -74.907489 & -56.744154 & -38.580819 & -20.417483 & -2.254148 & 15.909187 & 34.072522 & 52.235858 & 70.399193 \\ -93.634362 & -75.471026 & -57.307691 & -39.144356 & -20.981021 & -2.817685 & 15.34565 & 33.508985 & 51.672321 \\ -112.361234 & -94.197899 & -76.034563 & -57.871228 & -39.707893 & -21.544558 & -3.381222 & 14.782113 & 32.945448 \\ -131.088106 & -112.924771 & -94.761436 & -76.5981 & -58.434765 & -40.27143 & -22.108095 & -3.944759 & 14.218576 \\ -149.814979 & -131.651643 & -113.488308 & -95.324973 & -77.161637 & -58.998302 & -40.834967 & -22.671632 & -4.508296 \end{bmatrix}$$

GEOME5 PLANCK M/L vs PROTON M/L ARRAY

PLANCK	PROTON
$a := 28.128937030$	$b := -11.226534090$
$n := 0, 1 .. 8$	$m := 0, 1 .. 8$

$$J_{m,n} := m \cdot \left(\frac{a}{2}\right) - n \cdot \left(\frac{b}{2}\right)$$

$$J = \begin{bmatrix} 0 & 5.613267 & 11.226534 & 16.839801 & 22.453068 & 28.066335 & 33.679602 & 39.292869 & 44.906136 \\ 14.064469 & 19.677736 & 25.291003 & 30.90427 & 36.517537 & 42.130804 & 47.744071 & 53.357338 & 58.970605 \\ 28.128937 & 33.742204 & 39.355471 & 44.968738 & 50.582005 & 56.195272 & 61.808539 & 67.421806 & 73.035073 \\ 42.193406 & 47.806673 & 53.41994 & 59.033207 & 64.646474 & 70.259741 & 75.873008 & 81.486275 & 87.099542 \\ 56.257874 & 61.871141 & 67.484408 & 73.097675 & 78.710942 & 84.324209 & 89.937476 & 95.550743 & 101.16401 \\ 70.322343 & 75.93561 & 81.548877 & 87.162144 & 92.775411 & 98.388678 & 104.001945 & 109.615212 & 115.228479 \\ 84.386811 & 90.000078 & 95.613345 & 101.226612 & 106.839879 & 112.453146 & 118.066413 & 123.67968 & 129.292947 \\ 98.45128 & 104.064547 & 109.677814 & 115.291081 & 120.904348 & 126.517615 & 132.130882 & 137.744149 & 143.357416 \\ 112.515748 & 118.129015 & 123.742282 & 129.355549 & 134.968816 & 140.582083 & 146.19535 & 151.808617 & 157.421884 \end{bmatrix}$$

FORCETABLE 01 AUG 15, 2007 Planck Particle.

$a := 0, 1 .. 10$

$c := 10.476821$ $G := -7.175303$

$M := -4.662400$ $R := -32.791345$ $M - R = 28.128945 \approx \frac{c^2}{G}$

$$F_a := \frac{a}{2} \cdot (M - R) + c \cdot (4 - a) + G \cdot \left(\frac{a}{2} - 1 \right)$$

$$D_a := \frac{a}{2} \cdot (R - M) + c \cdot (4 + a) + G \cdot \left(\frac{-a}{2} - 1 \right)$$

a =

0
1
2
3
4
5
6
7
8
9
10

F =

	0
0	49.082587
1	49.082587
2	49.082587
3	49.082587
4	49.082587
5	49.082587
6	49.082587
7	49.082587
8	49.082587
9	49.082587
10	49.082587

D =

	0
0	49.082587
1	49.082587
2	49.082587
3	49.082587
4	49.082587
5	49.082587
6	49.082587
7	49.082587
8	49.082587
9	49.082587
10	49.082587

FORCETABLE 02 AUG 15, 2007 ELECTRON

$a := 0, 1 .. 10$

$c := 10.476821$ $G := -7.175303$

$M := -27.040511$ $R := -12.550068$ $M - R = -14.490443$

$$F_a := \frac{a}{2} \cdot (M - R) + c \cdot (4 - a) + G \cdot \left(\frac{a}{2} - 1 \right)$$

$$D_a := \frac{a}{2} \cdot (R - M) + c \cdot (4 + a) + G \cdot \left(\frac{-a}{2} - 1 \right)$$

$\delta = \sqrt{\mu S}$

a =

0
1
2
3
4
5
6
7
8
9
10

F =

	0
0	49.082587
1	27.772893
2	6.463199
3	-14.846495
4	-36.156189
5	-57.465883
6	-78.775577
7	-100.085271
8	-121.394965
9	-142.704659
10	-164.014353

D =

	0
0	49.082587
1	70.392281
2	91.701975
3	113.011669
4	134.321363
5	155.631057
6	176.940751
7	198.250445
8	219.560139
9	240.869833
10	262.179527

electron
$+ w - \delta$
$= 8.383296$

proton $+ w - \delta$
0.223524

$\delta\delta = 8.159772$

$\mu^{1/4} = 0.815977$

$\delta\delta = 10\mu^{1/4}$

FORCETABLE 02 AUG 15, 2007 PROTON

$a := 0, 1 .. 10$

$c := 10.476821$ $G := -7.175303$

$M := -23.776602$ $R := -12.550068$

$M - R = -11.226534$

$$F_a := \frac{a}{2}\cdot(M - R) + c\cdot(4 - a) + G\cdot\left(\frac{a}{2} - 1\right)$$

$$D_a := \frac{a}{2}\cdot(R - M) + c\cdot(4 + a) + G\cdot\left(\frac{-a}{2} - 1\right)$$

$\delta = \sqrt{\delta}$

δ of + w −

= 0.223524

a =

0
1
2
3
4
5
6
7
8
9
10

F =

	0
0	49.082587
1	29.4048475
2	9.727108
3	-9.9506315
4	-29.628371
5	-49.3061105
6	-68.98385
7	-88.6615895
8	-108.339329
9	-128.0170685
10	-147.694808

D =

	0
0	49.082587
1	68.7603265
2	88.438066
3	108.1158055
4	127.793545
5	147.4712845
6	167.149024
7	186.8267635
8	206.504503
9	226.1822425
10	245.859982

FORCETABLE 02 AUG 15, 2007 "DARK MATTER"

$a := 0, 1 .. 10$

$c := 10.476821$ $G := -7.175303$

$M := 14.451802$ $R := -12.550068$ $M - R = 27.001870$

$$F_a := \frac{a}{2} \cdot (M - R) + c \cdot (4 - a) + G \cdot \left(\frac{a}{2} - 1 \right)$$

$$D_a := \frac{a}{2} \cdot (R - M) + c \cdot (4 + a) + G \cdot \left(\frac{-a}{2} - 1 \right) \qquad \delta = (a\mu)^{1/2}$$

a =

0
1
2
3
4
5
6
7
8
9
10

F =

	0
0	49.082587
1	48.5190495
2	47.955512
3	47.3919745
4	46.828437
5	46.2648995
6	45.701362
7	45.1378245
8	44.574287
9	44.0107495
10	43.447212

D =

	0
0	49.082587
1	49.6461245
2	50.209662
3	50.7731995
4	51.336737
5	51.9002745
6	52.463812
7	53.0273495
8	53.590887
9	54.1544245
10	54.717962

FORCETABLE 02 AUG 15, 2007 NEUTRON STAR

$a := 0, 1 .. 10$

$c := 10.476821$ $G := -7.175303$

$M := 33.566004$ $R := 7.691209$ $M - R = 25.874795$

$$F_a := \frac{a}{2} \cdot (M - R) + c \cdot (4 - a) + G \cdot \left(\frac{a}{2} - 1 \right)$$

$$D_a := \frac{a}{2} \cdot (R - M) + c \cdot (4 + a) + G \cdot \left(\frac{-a}{2} - 1 \right) \qquad \delta = d\mu$$

a =

0
1
2
3
4
5
6
7
8
9
10

F =

	0
0	49.082587
1	47.955512
2	46.828437
3	45.701362
4	44.574287
5	43.447212
6	42.320137
7	41.193062
8	40.065987
9	38.938912
10	37.811837

D =

	0
0	49.082587
1	50.209662
2	51.336737
3	52.463812
4	53.590887
5	54.717962
6	55.845037
7	56.972112
8	58.099187
9	59.226262
10	60.353337

FORCETABLE 02 AUG 15, 2007 HUBBLE UNIVERSE

$a := 0, 1 .. 10$

$c := 10.476821$ $G := -7.175303$

$M := 52.680206$ $R := 27.932486$

$M - R = 24.747720$

$$F_a := \frac{a}{2} \cdot (M - R) + c \cdot (4 - a) + G \cdot \left(\frac{a}{2} - 1 \right)$$

$$D_a := \frac{a}{2} \cdot (R - M) + c \cdot (4 + a) + G \cdot \left(\frac{-a}{2} - 1 \right)$$

$\delta = (\alpha\mu)^{3/2}$

a =

0
1
2
3
4
5
6
7
8
9
10

F =

	0
0	49.082587
1	47.3919745
2	45.701362
3	44.0107495
4	42.320137
5	40.6295245
6	38.938912
7	37.2482995
8	35.557687
9	33.8670745
10	32.176462

D =

	0
0	49.082587
1	50.7731995
2	52.463812
3	54.1544245
4	55.845037
5	57.5356495
6	59.226262
7	60.9168745
8	62.607487
9	64.2980995
10	65.988712

M/L , $Q = c^2/G\sqrt{S}$

$m_{-2}/l_{-2} = 10.141\ 812\ 641 = Q(\alpha\mu)^{3/2}$

$m_{-1}/l_{-1} = 9.578\ 275\ 583 = Q(\alpha\mu)$

$\mathbf{m_o/l_o = 28.128\ 937\ 025} = Q\sqrt{S} = c^2/G$

$m_1/l_1 = 8.451\ 201\ 468 = Q$

$\mathbf{m_p/r_e = -11.226\ 534\ 090} = Q/\sqrt{S}$

$m_3/l_3 = 7.324\ 127\ 353 = Q(\alpha\mu)$

$m_4/l_4 = 6.760\ 590\ 295 = Q(\alpha\mu)^{3/2}$

$m_5/l_5 = 6.197\ 053\ 237 = Q(\alpha\mu)^2$

$m_6/l_6 = 5.633\ 516\ 180 = Q(\alpha\mu)^{5/2}$

$m_7/l_7 = 5.069\ 979\ 122 = Q(\alpha\mu)^3$

$m_8/l_8 = 4.506\ 442\ 065 = Q(\alpha\mu)^{7/2}$

$m_9/l_9 = 3.942\ 905\ 007 = Q(\alpha\mu)^4$

$m_{10}/l_{10} = 3.379\ 367\ 949 = Q(\alpha\mu)^{9/2}$

$P = (\alpha\mu)^{1/2}\hbar/c$ $\qquad$ $Q = c^2/G\sqrt{S}$

$m_{-2}\, l_{-2} = -95.923\,414\,249 = P\, S^{-3/2}$ $\qquad$ $m_{-2}/l_{-2} = 10.141\,812\,641 = Q\,(\alpha\mu)^{3/2}$

$m_{-1}\, l_{x-1} = -76.245\,678\,691 = P\, S^{-1}$ $\qquad$ $m_{-1}/l_{-1} = 9.578\,275\,583 = Q\,(\alpha\mu)$

$\mathbf{m_o\, l_o = -37.453\,744\,633} = P(\alpha\mu)^{-½} = \hbar/c$ $\qquad$ $\mathbf{m_o/l_o = 28.128\,937\,025} = Q\sqrt{S} = c^2/G$

$m_1\, l_1 = -36.890\,207\,576 = P$ $\qquad$ $m_1/l_1 = 8.451\,201\,468 = Q$

$\mathbf{m_p\, r_e = -36.326\,670\,518} = P\,(\alpha\mu)^{1/2}$ $\qquad$ $\mathbf{m_p/r_e = -11.226\,534\,090} = Q/\sqrt{S}$

$m_3\, l_3 = 2.465\,263\,539 = P\, S$ $\qquad$ $m_3/l_3 = 7.324\,127\,353 = Q\,(\alpha\mu)$

$m_4\, l_4 = 22.142\,999\,097 = P\, S^{3/2}$ $\qquad$ $m_4/l_4 = 6.760\,590\,295 = Q\,(\alpha\mu)^{3/2}$

$m_5\, l_5 = 41.820\,734\,655 = P\, S^2$ $\qquad$ $m_5/l_5 = 6.197\,053\,237 = Q\,(\alpha\mu)^2$

$m_6\, l_6 = 61.498\,470\,212 = P\, S^{5/2}$ $\qquad$ $m_6/l_6 = 5.633\,516\,180 = Q\,(\alpha\mu)^{5/2}$

$m_7\, l_7 = 81.176\,205\,770 = P\, S^3$ $\qquad$ $m_7/l_7 = 5.069\,979\,122 = Q\,(\alpha\mu)^3$

$m_8\, l_8 = 100.853\,941\,327 = P\, S^{7/2}$ $\qquad$ $m_8/l_8 = 4.506\,442\,065 = Q\,(\alpha\mu)^{7/2}$

$m_9\, l_9 = 120.531\,676\,885 = P\, S^4$ $\qquad$ $m_9/l_9 = 3.942\,905\,007 = Q\,(\alpha\mu)^4$

$m_{10}\, l_{10} = 140.209\,412\,443 = P\, S^{9/2}$ $\qquad$ $m_{10}/l_{10} = 3.379\,367\,949 = Q\,(\alpha\mu)^{9/2}$

$41.257197597 = m_d l_b$ $\qquad$ $25.874\,788\,795 = m_d/l_b$

$42.384271712 = m_b l_d$ $\qquad$ $-13.480\,682\,320 = m_b/l_d$

$1.127074115 = \alpha\mu$ $\qquad$ $39.355\,471\,115 = S$

$51.377833905 = m_d l_c$

$51.941370962 = m_c l_d$

$0.563537057 = (\alpha\mu)^{1/2}$

ML/t^2

$ML/t^2 = c^2\, M/L$

$Q = c^4/G\sqrt{S}$

$m_{-2}/l_{-2} = 31.095454047 = Q\,(\alpha\mu)^{3/2}$

$m_{-1}/l_{-1} = 30.531916989 = Q\,(\alpha\mu)$

$\mathbf{m_o/l_o = 49.082578431} = Q\sqrt{S} = c^2/G$

$m_1/l_1 = 29.404842874 = Q$

$\mathbf{m_p/r_e = 9.727107316} = Q/\sqrt{S}$

$m_3/l_3 = 28.277768759 = Q\,(\alpha\mu)$

$m_4/l_4 = 27.714231701 = Q\,(\alpha\mu)^{3/2}$

$m_5/l_5 = 27.150694643 = Q\,(\alpha\mu)^2$

$m_6/l_6 = 26.587157586 = Q\,(\alpha\mu)^{5/2}$

$m_7/l_7 = 26.023620528 = Q\,(\alpha\mu)^3$

$m_8/l_8 = 25.460083471 = Q\,(\alpha\mu)^{7/2}$

$m_9/l_9 = 24.896546413 = Q\,(\alpha\mu)^4$

$m_{10}/l_{10} = 24.333009355 = Q\,(\alpha\mu)^{9/2}$

M/L	ML/τ^2	
	$\tau^2 = L^3/GM$	
$Q = c^2/G\sqrt{S}$	$ML/\tau^2 = G(M/L)^2$	[GRAVITY]
$m_{-2}/l_{-2} = 10.141\ 812\ 641 = Q(\alpha\mu)^{3/2}$	13.108 329 663	
$m_{-1}/l_{-1} = 9.578\ 275\ 583 = Q(\alpha\mu)$	11.981 255 747	
$m_0/l_0 = 28.128\ 937\ 025 = Q\sqrt{S} = c^2/G$	**49.082 578 431**	
$m_1/l_1 = 8.451\ 201\ 468 = Q$	9.727 107 317	
$m_p/r_e = -11.226\ 534\ 090 = Q/\sqrt{S}$	**-29.628 363 799**	
$m_3/l_3 = 7.324\ 127\ 353 = Q(\alpha\mu)$	7.472 959 087	
$m_4/l_4 = 6.760\ 590\ 295 = Q(\alpha\mu)^{3/2}$	6.345 884 971	
$m_5/l_5 = 6.197\ 053\ 237 = Q(\alpha\mu)^2$	5.218 810 855	
$m_6/l_6 = 5.633\ 516\ 180 = Q(\alpha\mu)^{5/2}$	4.091 736 741	
$m_7/l_7 = 5.069\ 979\ 122 = Q(\alpha\mu)^3$	2.964 662 625	
$m_8/l_8 = 4.506\ 442\ 065 = Q(\alpha\mu)^{7/2}$	1.837 588 511	
$m_9/l_9 = 3.942\ 905\ 007 = Q(\alpha\mu)^4$	0.710 514 395	
$m_{10}/l_{10} = 3.379\ 367\ 949 = Q(\alpha\mu)^{9/2}$	-0.416 559 721	

M/L	ML/T^2
$Q = c^2/G\sqrt{S}$	$T = GM/c^3$ $ML/T^2 = Lc^6/MG^2$ or $-MG^2/Lc^6$ $c^6/G^2 = 77.211515456$
$m_{-2}/l_{-2} = 10.141\ 812\ 641 = Q(\alpha\mu)^{3/2}$	67.069 702 815
$m_{-1}/l_{-1} = 9.578\ 275\ 583 = Q(\alpha\mu)$	67.633 239 873
$m_o/l_o = 28.128\ 937\ 025 = Q\sqrt{S} = c^2/G$	**49.082 578 431**
$m_1/l_1 = 8.451\ 201\ 468 = Q$	68.760 313 988
$m_p/r_e = -11.226\ 534\ 090 = Q/\sqrt{S}$	**88.438 049 546**
$m_3/l_3 = 7.324\ 127\ 353 = Q(\alpha\mu)$	69.887 388 103
$m_4/l_4 = 6.760\ 590\ 295 = Q(\alpha\mu)^{3/2}$	70.450 925 161
$m_5/l_5 = 6.197\ 053\ 237 = Q(\alpha\mu)^2$	71.014 462 219
$m_6/l_6 = 5.633\ 516\ 180 = Q(\alpha\mu)^{5/2}$	71.577 999 276
$m_7/l_7 = 5.069\ 979\ 122 = Q(\alpha\mu)^3$	72.141 536 334
$m_8/l_8 = 4.506\ 442\ 065 = Q(\alpha\mu)^{7/2}$	72.705 073 391
$m_9/l_9 = 3.942\ 905\ 007 = Q(\alpha\mu)^4$	73.268 610 449
$m_{10}/l_{10} = 3.379\ 367\ 949 = Q(\alpha\mu)^{9/2}$	73.832 147 507

Changes cgs

1986

$m_e = 9.109\,389\,754 \times 10^{-28}$

$\log m_e = -27.040\,510\,72$

$m_p = 1.672\,623\,110 \times 10^{-24}$

$\log m_p = -23.776\,601\,91$

1998

$m_e = 9.109\,381\,887 \times 10^{-28}$

$\log m_e = -27.040\,511\,09$

$m_p = 1.672\,621\,581 \times 10^{-27}$

$\log m_p = -23.776\,602\,3$

2006

$m_e = 9.109\,382\,15$

$\log m_e = -27.040\,511\,08$

$m_p = 1.672\,621\,637$

$\log m_p = -23.776\,602\,29$

	$\log m_e$	$\log m_p$
1986	-27.040 510 72	-23.776 601 91
1998	-27.040 511 09	-23.776 602 30
2006	-27.040 511 08	-23.776 602 29

$\log G$ current -7.1756

-11-23	2006 #46	-7.175303
-3-26	2007 #11	-7.175 295 6095
-7-4	2008 #9	-7.175 295 619
-8-31	2009	-7.175 295 633

2006 $\log G$ ⟸ -7.175 596

$\mu = -7.175\,296$ - consistent G

$\Delta = 0.000\,300$

VALUPDATE3.WPD August 31, 2009

VALUES DOWNLOADED FROM **CODATA 2006**

	value SI	$\log_{10}$(cgs)	
c	2.99792458	10.476 820 703	Velocity of light
G	6.67428 e-11	-7.175 60	Newton's gravitational constant
ħ	1.054571628 e-34	-26.976 923 917	Planck's constant
a_o	0.52917720859 e-10	-8.276 398 869	Bohr radius
α	7.2973525376 e-3	-2.136 834 672	Fine structure constant
λ_c	$\alpha\, a_o$	-10.413 233 541	Compton wave length
r_e	$\alpha^2\, a_o$	-12.550 068 213	Electron radius
m_n	1.674927211 e-27	-23.776 004 062	Neutron mass
m_p	1.672621637 e-27	-23.776 602 289	Proton mass
m_e	9.10938215 e-31	-27.040 511 078	Electron mass
μ	m_p / m_e	3.263 908 789	Proton/electron mass ratio
N_A	6.02214179 e+23	23.779 750 977	Avogadro's ~~constant~~ number
α^{-1}		137.035 999 679	Eddington's ~~constant~~ number
m_o	$\sqrt{(\hbar c/G)}$	-4.662 3	Planck mass
l_o	$\sqrt{(G\hbar/c^3)}$	-32.791 5	Planck length

G

m_b

l_o

S DIRAC'S number

$23 \log E - 3 \log \mu = \log D$

α^{-1} S

$S m_o l_o = 1.901726$

$\frac{S m_o l_o}{3} \doteq (\alpha\mu)^3 - 3 \qquad \Delta = 0.000877$

VALUPDATE3.WPD August 31, 2009

VALUES DOWNLOADED FROM **CODATA 2006**

	value SI	$\log_{10}$(cgs)
c	2.99792458	10.476 820 703
G	6.67428 e-11	-7.175 60
$\hbar$	1.054571628 e-34	-26.976 923 917
a_o	0.52917720859 e-10	-8.276 398 869
α	7.2973525376 e-3	-2.136 834 672
λ_c	$\alpha\, a_o$	-10.413 233 541
r_e	$\alpha^2\, a_o$	-12.550 068 213
m_n	1.674927211 e-27	-23.776 004 062
m_p	1.672621637 e-27	-23.776 602 289
m_e	9.10938215 e-31	-27.040 511 078
μ	m_p / m_e	3.263 908 789
N_A	6.02214179 e+23	23.779 750 977
α^{-1}		137.035 999 679

NEWVAL.WPD January 27, 2009

N_A = Avogadro's constant
u = atomic mass unit
m_p = proton mass
m_e = electron mass
$\mu = m_p/m_e$
α = the fine structure constant
m_o = the Planck mass

	Log_{10}
$N_A = 6.022136736 \times 10^{23}\ \text{mol}^{-1}$	23.779 750 612
$u = 1.660540210 \times 10^{-24}$ g	-23.779 750 603
$m_p = 1.672623110 \times 10^{-24}$ g	-23.776 601 907
$m_p/u = 1.007276470$	0.003 148 696
$m_p/m_e = 1836.152701$	3.263 908 796
$\alpha = 7.29735308 \times 10^{-3}$	-2.136 834 640
m_o	-4.662 403 804
m_o/u	19.117 346 799
m_o/m_p	19.114 198 500
$(m_o/u)^2$	38.234 693 598
$\hbar c/Gu^2$	38.234 693 598
$\alpha\mu\,(m_o/u)^2$	39.361 767 713
$(5+\sqrt{15})^2/2 = 39.364\ 916\ 731$	
$\Delta = 0.003\ 149$	
$S = \alpha\mu\,(m_o/m_p)^2$	39.355 471 115
$\Delta = 0.009\ 476$	

10.4176820 703

Constant	Symbol	Dimension	Value in SI units with uncertainties[2]
Speed of light in vacuum	c	$L\,T^{-1}$	299,792,458 m s^{-1} *(exact)* by definition
Gravitational constant	G	$L^3\,M^{-1}\,T^{-2}$	6.674 28(67) × 10^{-11} m^3 kg^{-1} s^{-2}
Reduced Planck constant	$\hbar = h/2\pi$, where h is the Planck constant	$L^2\,M\,T^{-1}$	1.054 571 628(53) × 10^{-34} J s
Coulomb constant	$\frac{1}{4\pi\varepsilon_0}$ where ε_0 is the permittivity of free space	$L^3\,M\,T^{-2}\,Q^{-2}$	8,987,551,787.368 1764 kg m^3 s^{-2} C^{-2} *(exact)*
Boltzmann constant	k_B	$L^2\,M\,T^{-2}\,\Theta^{-1}$	1.380 6504(24) × 10^{-23} J K^{-1}

7.175 595 5 78

-26.976 823 92

Key: L = length, M = mass, T = time, Q = electric charge, Θ = temperature. The exact values are due to the definitions of the metre and the ampere.

Accuracies

$\hbar$ 50 in 10^9

G 1 in 10^4

$$a_0 = \frac{m_p}{m_e}\,\frac{l_p}{\alpha}$$

$$E = \hbar\omega$$

↑ angular frequency

It is the dimensionless constants that define the world

The Universe	Age	4.3×10^{17} sec	17.633 468 456
	Diam	8.7×10^{26} m	28.939 519 253
	Mass	10^{80} protons	56.224
	Tmb	2.725	

UNITG2.WPD January 24, 2007 Separated
All values $\log_{10}$(cgs)

Newton's constant	$G = L^3/MT^2$	**–7.175303**
velocity of light	$c = L/T$	**10.476821**
Planck's constant	$\hbar = ML^2/T$	**–26.976924**

VALUES FOR PHYSICAL PARAMETERS INVOLVING THE NEW **G**

planck mass	$m_o = (\hbar c/G)^{1/2}$	**–4.662400**	[M]
planck length	$l_o = (G\hbar/c^3)^{1/2}$	**–32.791345**	[L]
planck time	$t_o = (G\hbar/c^5)^{1/2}$	**–43.268166**	[T]
schwarzschild bound	$c^2/G = m_o/l_o$	**28.128945**	[M/L]
planck mass/time	$c^3/G = m_o/t_o$	**38.605766**	[M/T]
planck force	$c^4/G = m_o l_o/t_o^2$	**49.082587**	[ML/T^2]
planck power	$c^5/G = \hbar/t_o^2$	**59.559408**	[ML^2/T^3]
planck energy	$\epsilon_o = (\hbar c^5/G)^{1/2}$	**16.291242**	[ML^2/T^2]
planck density	$\rho_o = m_o/ l_o^3$	**93.711635**	[M/L^3]

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heisenberg bound	$\hbar/c = m_o \cdot l_o$	**–37.453745**	[ML]
electron radius	r_e	**–12.550068**	[L]
electron mass	m_e	**–27.040511**	[M]
proton mass	m_p	**–23.776602**	[M]
neutron mass	m_n	**–23.776004**	[M]

REDIMEN.WPD February 2, 2007

REDIMENSIONING: MASS, LENGTH AND PURE NUMBER PART I

The 2002 values:[1]

Proton mass:	$m_p = 1.672\ 621\ 581 \times 10^{-24}$ g
Electron mass:	$m_e = 9.109\ 381\ 887 \times 10^{-28}$ g
Electron radius	$r_e = 2.817\ 940\ 285 \times 10^{-13}$ cm
Proton/Electron mass ratio	$\mu = 1836.152\ 667\ 5$
Fine structure constant	$\alpha = 7.297\ 352\ 533 \times 10^{-3}$
	$\alpha^{-1} = 137.035\ 999\ 96$

The corresponding $\log_{10}$(cgs) values:

$m_p = -23.776\ 602\ 304$ g
$m_e = -27.040\ 511\ 091$ g
$r_e = -12.550\ 068\ 214$ cm
$\mu = 3.263\ 908\ 788$
$\alpha = -2.136\ 834\ 673$
$\alpha\mu = 1.127\ 074\ 115$

The following $\log_{10}$ values are derived from the $\log_{10}$(G) value = –7.175303

Planck mass $= (\hbar c/G)^{1/2}$ $m_o = -4.662400$
Planck length, $= (\hbar G/c^3)^{1/2}$ $l_o = -32.791345$

$m_p/m_o = -19.114202 = \alpha^{12}\,\mu^2$
$r_e/l_o = +20.241277 = \alpha^{-11}\,\mu^{-1}$
$m_p r_e/m_o l_o = 1.127074 = \alpha\,\mu$
$m_p l_o/m_o r_e = 39.355479 = \alpha^{-23}\,\mu^{-3} = S$

where S is the ratio of coulomb force to gravity.[2]

Designating m_p/m_o as a mass scale unit = M ,

	M^{-1}	M^0	M^1	M^2	M^3
	baryon	planck	dark	stellar	universe
	$\alpha^{12}\,\mu^2$	$\alpha^0\,\mu^0$	$\alpha^{-12}\,\mu^{-2}$	$\alpha^{-24}\,\mu^{-4}$	$\alpha^{-36}\,\mu^{-6}$
	–19.114202	1	+19.114202	+38.228404	+57.342606
In grams:	–23.776602	–4.662400	+14,451802	+33.566004	+52.680206

Designating r_e/l_o as a size scale unit = L,

	L^{-1}	L^0	L^1	L^2	L^3
	dark	planck	baryon	stellar	universe
	$\alpha^{11}\,\mu^1$	$\alpha^0\,\mu^0$	$\alpha^{-11}\,\mu^{-1}$	$\alpha^{-22}\,\mu^{-2}$	$\alpha^{-33}\,\mu^{-3}$
	–20.241277	1	+20.241277	+40.482554	+60.723831
In cm:	–53.032622	–32.791345	–12.550068	+ 7.691209	+27.932486

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[1] Physics Today, August 2002

[2] S is defined as $\hbar\alpha c / G m_p m_e = \alpha\mu(m_o/m_p)^2$

NEWNUMB.WPD March 26, 2007

Values 2002 [American Scientist]			Log_{10}(cgs)
Fine structure constant	α	$7.297\,352\,533\ \ 10^{-3}$	-2.136 834 6726
Proton–electron mass ratio	μ	1836.152 667 5	3.263 908 7879
Planck's constant	$\hbar$	$1.054\,571\,596\ 10^{-34}$ Js	-26.976 923 9302
Velocity of light	c	299 792 458 km/s	10.476 820 7029
Proton mass	m_p	$1.672\,621\,58\ 10^{-27}$ kg	-23.776 602 3043

A revised value for G:

The current value for the Planck mass is $m_o = -4.662\,199$
Using the above value for m_p, $m_p/m_o = -19.114\,403$
$\alpha^{12}\,\mu^2 = -19.114\,198\,4954$ and $m_p/(\alpha^{12}\mu^2) = -4.662\,403\,8089$
Assume this last value is the correct value of m_o then since $m_o = \checkmark(\hbar c/G)$,
$G = \hbar c/m_o^2 = -7.175\,295\,6095$ vs the current value $G = -7.175\,705$

The revised value of $G = -7.175\,296$ leads to the following values:

planck mass	$m_o = (\hbar c/G)^{1/2}$	=	–4.662 403 8089
planck length	$l_o = (G\hbar/c^3)^{1/2}$	=	–32.791 340 8242
planck time	$t_o = (G\hbar/c^5)^{1/2}$	=	–43.268 161 5271
planck force	$f_o = c^4/G$	=	49.082 578 4211
planck power	$p_o = c^5/G = \hbar/t_o^2$	=	59.559 399 1240
planck energy	$\epsilon_o = (\hbar c^5/G)^{1/2}$	=	16.291 237 5969
planck density	$\rho_o = m_o/l_o^3$	=	93.711 618 6637
	$\alpha\mu$	=	1.127 074 1153
force ratio	$S = \alpha\mu(m_o/m_p)^2$	=	39.355 471 4061

~~NEWG~~ NEWG NOT IN NOTE BOOK 2008

Same as NEWNUMB2

Using the new values for m_o and l_o, the ratio $m_o r_e/m_p l_o = 39.355\ 471\ 115$
If this is taken as the new value of S, then since $S = \hbar\alpha c/Gm_p m_e$ or $G = \alpha\mu\hbar c/Sm_p^2$,
then G is again = −7.175 295 619 and $S = 39.355\ 471\ 115 = \alpha^{-23}\mu^{-3}$

VALUES DERIVED FROM **G = −7.175 295 619** [all $\log_{10}$(cgs)]

Planck mass	$m_o = (\hbar c/G)^{1/2}$	−4.662 403 804
Planck length	$l_o = (G\hbar/c^3)^{1/2}$	−32.791 340 829
Planck time	$t_o = (G\hbar/c^5)^{1/2}$	−43.268 161 532
Planck energy	$m_o l_o^2/t_o^2 = (\hbar c^5/G)^{1/2}$	16.291 237 602
Planck density	$m_o/l_o^3 = c^5/\hbar G^2$	93.711 618 683
Schwarzschild bound	$m_o/l_o = c^2/G$	28.128 937 025
Planck mass/time	$m_o/t_o = c^3/G$	38.605 757 728
Planck force	$m_o l_o/t_o^2 = c^4/G$	49.082 578 431
Planck power	$m_o l_o^2/t_o^3 = c^5/G$	59.559 399 134

MET
NUMVAL.WPD
September 28, 2007November 2, 2007 February 18, 2008 June 13, 2008

METRIC NUMERICAL VALUES

ALL VALUES ARE LOG_{10}(cgs)

FUNDAMENTAL CONSTANTS:

NEWTON'S CONSTANT	G =	−7.175 295 619	[L^3/MT^2]
PLANCK'S CONSTANT	ħ =	−26.976 923 930	[ML^2/T]
VELOCITY OF LIGHT	c =	10.476 820 703	[L/T]
PROTON MASS/ELECTRON MASS	μ =	3.263 908 788	[0]
FINE STRUCTURE CONSTANT	α =	−2.136 834 673	[0] # = 137,035 999
COULOMB/GRAVITY FORCE RATIO	S =	39.355 471 115	[0] Eddingtons number
	αμ =	1.127 074 115	[0] Dirac's Number

PLANCK VALUES:

PLANCK MASS	$m_o = \sqrt{cħ/G}$	= −4.662 403 804	[M]	
PLANCK LENGTH	$l_o = \sqrt{Għ/c^3}$	= −32.791 340 829	[L]	
PLANCK TIME	$t_o = \sqrt{Għ/c^5}$	= −43.268 161 532	[T]	
	c/G	= 17.652 116 322	[MT/L^2]	
SCHWARTZSCHILD BOUND	c^2/G	= 28.128 937 025	[M/L]	m_o/l_o
TIME FACTOR	c^3/G	= 38.605 757 728	[M/T]	
PLANCK FORCE	c^4/G	= 49.082 578 431	[ML/T^2]	
PLANCK POWER	c^5/G	= 59.559 399 134	[ML^2/T^3]	
PLANCK ENERGY	$\sqrt{ħc^5/G}$	= 16.291 237 602	[ML^2/T^2]	
"	$\sqrt{ħc^5/G}$	= $m_oc^2 = Gm_o^2/l_o = ħ/t_o$	[ML^2/T^2]	
PLANCK DENSITY	$c^5/ħG^2$	= 93.711 618 683	[M/L^3]	
[PLANCK CHARGE]^2	ħc	= −16.500 103 227	[ML^3/T^2]	
$m_o \cdot l_o$	ħ/c	= −37.453 744 633	[ML]	
$m_o \cdot t_o$	ħ/c^2	= −47.930 565 336	[MT]	

m_o^a = −9.324 807 608

BARYON VALUES:

a_o = −8.276 398 868

PROTON MASS	m_p	= −23.776 602 304	[M]	
NEUTRON MASS	m_n	= −23.776 004 075	[M]	
ELECTRON MASS	m_e	= −27.040 511 092	[M]	
ELECTRON RADIUS	r_e	= −12.550 068 214	[L]	
ELECTRON FREQUENCY	c/r_e	= +23.026 888 917	[1/T]	
[ELECTRON CHARGE]^2	ħαc	= −18.636 937 900	[ML^3/T^2]	e^2

sec in sidereal year
log 7.499 112 12a

log 7.499 103 957
sec in 366.25 days
315 576 000 sec

log π = 0.497 149 873
log 4π = 1.099 209 864
log 4/3π = 0.622 088 609
log 2π = 0.798 179 868

1 meter = 39.37 in

1 in = 2.54 cm

1 lb = 373.242 g

1 kg = 2.20462 lbs

POWERS AND ROOTS:

c	10.476 820 703	l_o	–32.791 340 829	r_e	–12.550 068 214
c^2	20.953 641 406	l_o^2	–65.582 681 658	r_e^2	–25.100 136 428
c^3	31.430 462 109	l_o^3	–98.374 022 487	r_e^3	–37.650 204 642
c^4	41.907 282 812	l_o^4	–131.165 363 316.	r_e^4	–50.200 272 856
c^5	52.384 103 515	l_o^5	–163.956 704 145	r_e^5	–62.750 341 070
c^6	62.860 924 218	l_o^6	–196.748 044 974	r_e^6	–75.300 409 284
c^7	73.337 744 921	l_o^7	–229.539 385 803	r_e^7	–87.850 477 498
c^8	83.814 565 624	l_o^8	–262.330 726 632	r_e^8	–100.400 545 712
c^9	94.291 386 327	l_o^9	–295.122 067 461	r_e^9	–112.950 613 926
c^{10}	104.768 207 03	l_o^{10}	–327.913 408 29	r_e^{10}	–125.500 682 14

TEMPLATE VALUES

$S^{1/2}$	=	19.677 735 557		$(\alpha\mu)^{1/2}$	=	0.563 537 057
S	=	39.355 471 115	= $\alpha^{-23}\mu^{-3}$	$(\alpha\mu)$	=	1.127 074 115
$S^{3/2}$	=	59.033 206 671		$(\alpha\mu)^{3/2}$	=	1.690 611 171
S^2	=	78.710 942 230	= $\alpha^{-46}\mu^{-6}$	$(\alpha\mu)^2$	=	2.254 148 230
$S^{5/2}$	=	98.388 677 785		$(\alpha\mu)^{5/2}$	=	2.817 685 288
S^3	=	118.066 413 342	= $\alpha^{-69}\mu^{-9}$	$(\alpha\mu)^3$	=	3.381 222 342
$S^{7/2}$	=	137.744 148 899		$(\alpha\mu)^{7/2}$	=	3.944 759 403
S^4	=	157.421 884 456	= $\alpha^{-92}\mu^{-12}$	$(\alpha\mu)^4$	=	4.508 296 460
$S^{9/2}$	=	177.099 620 013		$(\alpha\mu)^{9/2}$	=	5.071 833 518
S^5	=	196.777 355 570	= $\alpha^{-115}\mu^{-15}$	$(\alpha\mu)^5$	=	5.635 370 575
$S^{11/2}$	=	216.455 091 127		$(\alpha\mu)^{11/2}$	=	6.198 907 633
S^6	=	236.132 826 684	= $\alpha^{-138}\mu^{-18}$	$(\alpha\mu)^6$	=	6.762 444 690
$S^{13/2}$	=	255.810 562 241		$(\alpha\mu)^{13/2}$	=	7.325 981 741
S^7	=	275.488 297 798	= $\alpha^{-161}\mu^{-21}$	$(\alpha\mu)^7$	=	7.889 518 798
$S^{15/2}$	=	295.166 033 355		$(\alpha\mu)^{15/2}$	=	8.453 055 855
S^8	=	314.843 768 912	= $\alpha^{-184}\mu^{-24}$	$(\alpha\mu)^8$	=	9.016 592 912

$(\alpha\mu)^{17}$ = 10.143 667 026

$(S/\alpha\mu)^{1/4}$	=	9.557 099 250	= $\alpha^{-6}\mu^{-1}$	$(\alpha\mu S)^{1/4}$	=	10.120 636 308	= $\alpha^{-11/2}\mu^{-1/2}$
$(S/\alpha\mu)^{1/2}$	=	19.114 198 500	= $\alpha^{-12}\mu^{-2}$	$(\alpha\mu S)^{1/2}$	=	20.241 272 615	= $\alpha^{-11}\mu^{-1}$
$(S/\alpha\mu)$	=	38.228 397 000	= $\alpha^{-24}\mu^{-4}$	$(\alpha\mu S)$	=	40.482 545 230	= $\alpha^{-22}\mu^{-2}$
$(S/\alpha\mu)^{3/2}$	=	57.342 595 500	= $\alpha^{-36}\mu^{-6}$	$(\alpha\mu S)^{3/2}$	=	60.723 817 845	= $\alpha^{-33}\mu^{-3}$
$(S/\alpha\mu)^{2}$	=	76.456 794 000	= $\alpha^{-48}\mu^{-8}$	$(\alpha\mu S)^{2}$	=	80.965 090 460	= $\alpha^{-44}\mu^{-4}$
$(S/\alpha\mu)^{5/2}$	=	95.570 992 500	= $\alpha^{-60}\mu^{-10}$	$(\alpha\mu S)^{5/2}$	=	101.206 363 075	= $\alpha^{-55}\mu^{-5}$
$(S/\alpha\mu)^{3}$	=	114.685 191 000	= $\alpha^{-72}\mu^{-12}$	$(\alpha\mu S)^{3}$	=	121.447 635 690	= $\alpha^{-66}\mu^{-6}$
$(S/\alpha\mu)^{7/2}$	=	133.799 389 500	= $\alpha^{-84}\mu^{-14}$	$(\alpha\mu S)^{7/2}$	=	141.688 908 305	= $\alpha^{-77}\mu^{-7}$
$(S/\alpha\mu)^{4}$	=	152.913 588 000	= $\alpha^{-96}\mu^{-16}$	$(\alpha\mu S)^{4}$	=	161.930 180 920	= $\alpha^{-88}\mu^{-8}$
$(S/\alpha\mu)^{9/2}$	=	172.027 786 500	= $\alpha^{-108}\mu^{-18}$	$(\alpha\mu S)^{9/2}$	=	182.171 453 535	= $\alpha^{-99}\mu^{-9}$
$(S/\alpha\mu)^{5}$	=	191.141 985 000	= $\alpha^{-120}\mu^{-20}$	$(\alpha\mu S)^{5}$	=	202.412 726 15	= $\alpha^{-110}\mu^{-10}$
$(S/\alpha\mu)^{11/2}$	=	210.256 183 500	= $\alpha^{-132}\mu^{-22}$	$(\alpha\mu S)^{11/2}$	=	222.653 998 765	= $\alpha^{-121}\mu^{-11}$
$(S/\alpha\mu)^{6}$	=	229.370 382 000	= $\alpha^{-144}\mu^{-24}$	$(\alpha\mu S)^{6}$	=	242.895 271 38	= $\alpha^{-132}\mu^{-12}$

$\alpha^{1/2}$	=	−1.068 417 336	$\mu^{1/2}$	=	1.631 954 394	$(\alpha/\mu)^{1/2}$	= −2.700 371 731
α	=	−2.136 834 673	μ	=	3.263 908 788	(α/μ)	= −5.400 743 462
$\alpha^{3/2}$	=	−3.205 252 008	$\mu^{3/2}$	=	4.895 863 182	$(\alpha/\mu)^{3/2}$	= −8.101 115 193
α^{2}	=	−4.273 669 346	μ^{2}	=	6.527 817 576	$(\alpha/\mu)^{2}$	= −10.801 486 924
$\alpha^{5/2}$	=	−5.342 086 680	$\mu^{5/2}$	=	8.159 771 970	$(\alpha/\mu)^{5/2}$	= −13.501 858655
α^{3}	=	−6.410 504 016	μ^{3}	=	9.791 726 364	$(\alpha/\mu)^{3}$	= −16.202 230 386
$\alpha^{7/2}$	=	−7.478 921 352	$\mu^{7/2}$	=	11.423 680 758	$(\alpha/\mu)^{7/2}$	= −18.902 602 117
α^{4}	=	−8.547 338 688	μ^{4}	=	13.055 635 152	$(\alpha/\mu)^{4}$	= −21.602 973 848
$\alpha^{9/2}$	=	−9.615 756 024	$\mu^{9/2}$	=	14.687 589 546	$(\alpha/\mu)^{9/2}$	= −24.303 345 579
α^{5}	=	−10.684 173 36	μ^{5}	=	16.319 543 940	$(\alpha/\mu)^{5}$	= −27.003 717 310
$\alpha^{11/2}$	=	−11.752 590 696	$\mu^{11/2}$	=	17.951 498 334	$(\alpha/\mu)^{11/2}$	= −29.704 089 041
α^{6}	=	−12.821 008 032	μ^{6}	=	19.583 452 728	$(\alpha/\mu)^{6}$	= −32.404 460 772
$\alpha^{13/2}$	=	−13.889 425 368	$\mu^{13/2}$	=	21.215 407 122	$(\alpha/\mu)^{13/2}$	= −35.104 832 503
α^{7}	=	−14.957 842 704	μ^{7}	=	22.847 361 516	$(\alpha/\mu)^{7}$	= −37.805 204 234
$\alpha^{15/2}$	=	−16.026 260 004	$\mu^{15/2}$	=	24.479 315 910	$(\alpha/\mu)^{15/2}$	= −40.505 575 965
α^{8}	=	−17.094 677 376	μ^{8}	=	26.111 270 304	$(\alpha/\mu)^{8}$	= −43.205 947 696

NOTES:

fermi	r_e	=	−12.550 068 214	$\hbar\alpha/m_e c$	[L]
compton wave length	λ_c	=	−10.413 233 541	$\hbar/m_e c$	[L]
bohr radius	a_o	=	−8.276 398 868	$\hbar/m_e c\alpha$	[L]
rydberg *	r_∞^{-1}	=	−6.139 564 195	$\hbar/m_e c\alpha^2$	[L]

Each of the above lengths differ by α.

*The Rydberg constant $R_\infty = m_e c\,\alpha^2/4\pi\hbar = 5.040\,354\,331$ [L^{-1}].
The above quantity $r_\infty^{-1} = \hbar/m_e c\alpha^2$. (i.e.no 4π) [L]

PYTHLEVELS.WPD September 7, 2008

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COSMOLOGICAL MASS AND SIZE LEVELS

m_o/m_p = 19.114 198 500 = $(S/\alpha\mu)^{1/2}$ | r_e/l_o = 20.241 272 615 = $(\alpha\mu S)^{1/2}$

$M = \sqrt{\ }$ = 9.557 099 250 = $(S/\alpha\mu)^{1/4}$ | $L = \sqrt{\ }$ = 10.120 636 308 = $(\alpha\mu S)^{1/4}$

$\alpha\mu$ = 1.127 074 115 | S = 39.355 471 115

$\sqrt{\alpha\mu}$ = 0.563 537 057 | $\sqrt{S}$ = 19.677 735 557

$\hbar/c$ = –37.453 744 633 [ML] | c^2/G = 28.128 937 025 [M/L]

t_o = –43.268 161 532 is the planck time | c^3/G = 38.605 757 728

m_o = –4.662 403 804 is the planck mass | l_o = -32.791 340 829 is the planck radius

m_p = –23,776 602 304 is the proton mass | r_e = –12.550 068 214 is the electron radius

m_{-2} = –42.890 800 804 = $m_p M^{-2} m_o (S/\alpha\mu)^{-1}$ | l_{-2} = –53.032 613 445 = $l_o L^{-2} = l_o(\alpha\mu S)^{-1/2}$

m_{-1} = –33.333 701 554 = $m_p M^{-1}$ | l_{-1} = –42.911 977 137 = $l_o L^{-1}$

m_p = –23.776 602 304 = $m_p M^0 = m_o (S/\alpha\mu)^{-1/2}$ | **l_o = –32.791 340 829** = $l_o L^0 = l_o(\alpha\mu S)^0$

m_1 = -14.219 503 054 = $m_p M^1$ | l_1 = –22.6707045215 = $l_o L^1$

m_o = –4.662 403 804 = $m_p M^2$ $m_o(S/\alpha\mu)^0$ | **r_e = –12.550 068 214** = $l_o L^2 = l_o(\alpha\mu S)^{1/2}$

m_3 = 4.894 695 446 = $m_p M^3$ | l_3 = –2.429 431 907 = $l_o L^3$

m_4 = 14.451 794 696 = $m_p M^4 = m_o(S/\alpha\mu)^{1/2}$ | l_4 = 7.691 204 401 = $l_o L^4 = l_o(\alpha\mu S)^1$

m_5 = 24.008 893 946 = $m_p M^5$ | l_5 = 17.811 840 709 = $l_o L^5$

m_6 = 33.565 993 196 = $m_p M^6 = m_o(S/\alpha\mu)^1$ | l_6 = 27.932 477 016 = $l_o L^6 = l_o(\alpha\mu S)^{3/2}$

m_7 = 43.123 092 446 = $m_p M^7$ | l_7 = 38.053 113 324 = $l_o L^7$

m_8 = 52.680 191 696 = $m_p M^8 = m_o(S/\alpha\mu)^{3/2}$ | l_8 = 48.173 749 631 = $l_o L^8 = l_o(\alpha\mu S)^2$

m_9 = 62.237 290 946 = $m_p M^9$ | l_9 = 58.294 385 939 = $l_o L^9$

m_{10} = 71.794 390 196 = $m_p M^{10} = m_o(S/\alpha\mu)^2$ | l_{10} = 68.415 022 247 = $l_o L^{10} = l_o(\alpha\mu S)^{5/2}$

$\Delta = \sqrt{M}$ = 9.557 099 250 | $\Delta = \sqrt{L}$ = 10.120 636 308

$m_o M^{n-2} = m_p M^n = m_o(S/\alpha\mu)^{(n-2)/4}$ | $r_e L^{n-2} = l_o L^n = l_o(\alpha\mu S)^{n/4}$

COSMOLOGICAL MASS AND SIZE LEVELS

M·L	M/L
$P = (\alpha\mu)^{1/2}\hbar/c$	$Q = c^2/G\sqrt{S}$
$m_{-2}\, l_{-2} = -95.923\,414\,249 = P\, S^{-3/2}$	$m_{-2}/l_{-2} = 10.141\,812\,641 = Q\,(\alpha\mu)^{3/2}$
$m_{-1}\, l_{x-1} = -76.245\,678\,691 = P\, S^{-1}$	$m_{-1}/l_{-1} = 9.578\,275\,583 = Q\,(\alpha\mu)$
$\mathbf{m_o\, l_o = -37.453\,744\,633} = P(\alpha\mu)^{-1/2} = \hbar/c$	$\mathbf{m_o/l_o = 28.128\,937\,025} = Q\sqrt{S} = c^2/G$
$m_1\, l_1 = -36.890\,207\,576 = P$	$m_1/l_1 = 8.451\,201\,468 = Q$
$\mathbf{m_p\, r_e = -36.326\,670\,518} = P\,(\alpha\mu)^{1/2}$	$\mathbf{m_p/r_e = -11.226\,534\,090} = Q/\sqrt{S}$
$m_3\, l_3 = 2.465\,263\,539 = P\, S$	$m_3/l_3 = 7.324\,127\,353 = Q\,(\alpha\mu)^{-1/2}$
$m_4\, l_4 = 22.142\,999\,097 = P\, S^{3/2}$	$m_4/l_4 = 6.760\,590\,295 = Q\,(\alpha\mu)^{3/2}$
$m_5\, l_5 = 41.820\,734\,655 = P\, S^2$	$m_5/l_5 = 6.197\,053\,237 = Q\,(\alpha\mu)^2$
$m_6\, l_6 = 61.498\,470\,212 = P\, S^{5/2}$	$m_6/l_6 = 5.633\,516\,180 = Q\,(\alpha\mu)^{5/2}$
$m_7\, l_7 = 81.176\,205\,770 = P\, S^3$	$m_7/l_7 = 5.069\,979\,122 = Q\,(\alpha\mu)^3$
$m_8\, l_8 = 100.853\,941\,327 = P\, S^{7/2}$	$m_8/l_8 = 4.506\,442\,065 = Q\,(\alpha\mu)^{7/2}$
$m_9\, l_9 = 120.531\,676\,885 = P\, S^4$	$m_9/l_9 = 3.942\,905\,007 = Q\,(\alpha\mu)^4$
$m_{10}\, l_{10} = 140.209\,412\,443 = P\, S^{9/2}$	$m_{10}/l_{10} = 3.379\,367\,949 = Q\,(\alpha\mu)^{9/2}$

$\Delta = S^{1/2}$ $\qquad$ $\Delta = (\alpha\mu)^{1/2}$

43,511

83.9

$P, Q = \sqrt{\frac{\alpha\mu}{S}}\, m_D^2$

$\frac{P}{Q} = \sqrt{\alpha\mu S}\, \rho_D^2$

TABLE I
[Measures in $\log_{10}$(cgs) units]

LEVEL	LENGTH	TIME	MASS	VOLUME	M/L	M ·L
units	centimeters	seconds	grams	centimeters^3	gr/cm	gr ·cm
DARK MTR.	–53.032 612	–63.509 434	14.451796	–159.097 836	67.484 408	–38.580 816
Planck c G ħ	$(Għ/c^3)^{1/2}$	$(Għ/c^5)^{1/2}$	$(cħ/G)^{1/2}$	$(Għ/c^3)^{3/2}$	c^2/G	ħ/c
Planck numer	–32.791 340	–43.268 161	–4.662 403	–98.374 020	28.128 937	–37.453 745
BARYON	–12.550 068	–23.026 889	–23.776 602	–37.650 204	–11.226 534	–36.326 670
STAR	7.691 205	–2.785 617	33.565 995	23.073 614	25.874 790	41.257 200
UNIVERSE	27.932 478	17.455 657	52.680 194	83.797 432	24.747 716	80.612 672

TIME TABLES: SIX SPECIES

Values are in $\log_{10}$(cgs) seconds

LEVEL	TIME t	TIME T	TIME K	TIME Z	TIME τ	TIME η
formulae	t =L/c	$T = GM/c^3$	$K = ħ/Mc^2$	$Z = G ħ/c^4L$	$\tau = \sqrt{L^3/GM}$	$\eta = \sqrt{G^3ħ^2M/c^{10}L^3}$
DARK MTR.	–63.509 433	–24.153 960	–62.382 361	–23.026 889	–83.187 168	–3.349 154
Planck c G ħ	$(Għ/c^5)^{1/2}$	$(Għ/c^5)^{1/2}$	$(Għ/c^5)^{1/2}$	$(Għ/c^5)^{1/2}$	$(Għ/c^5)^{1/2}$	$(Għ/c^5)^{1/2}$
Planck number	–43.268 161	–43.268 161	–43.268 161	–43.268 161	–43.268 161	–43.268 161
BARYON	–23.026 889	–62.382 358	–24.153 963	–63.509 433	–3.349 503	–83.187 168
STAR	–2.785 617	–5.039 761	–81.496 560	–83.750 706	–1.658 543	–84.877 779
UNIVERSE	17.455 655	14.074 438	–100.610759	–103.991 979	19.146 267	–105.682 585

COSMOLOGICAL TIME LEVELS

m_o/m_p = 19.114 198 500 = $(S/\alpha\mu)^{1/2}$
$M = \sqrt{\ }$ = 9.557 099 250 = $(S/\alpha\mu)^{1/4}$
$\alpha\mu$ = 1.127 074 115
$\sqrt{\alpha\mu}$ = 0.563 537 057
$\hbar/c$ = –37.453 744 633 [ML]
t_o = –43.268 161 532 is the planck time
m_o = –4.662 403 804 is the planck mass
m_p = –23,776 602 304 is the proton mass

r_e/l_o = 20.241 272 615 = $(\alpha\mu S)^{1/2}$
$L = \sqrt{\ }$ = 10.120 636 308 = $(\alpha\mu S)^{1/4}$
S = 39.355 471 115
$\sqrt{S}$ = 19.677 735 557
c^2/G = 28.128 937 025 [M/L]
c^3/G = 38.605 757 728
l_o = -32.791 340 829 is the planck radius
r_e = –12.550 068 214 is the electron radius

$T^2 = t^3/T$

$t = L/c$		$T = GM/c^3$	
Δ = 10.120 636 308		Δ = 9.557 099 250	
t_{-2} = –63.509 434 148		T_{-2} = –81.496 558 532	
t_{-1} = –53.388 797 840		T_{-1} = –71.939 459 282	
t_o = –43.268 161 532	P_L	**T_o = –43.268 161 532**	P_L ~ 43.268
t_1 = –33.147 525 224		T_1 = –52.825 360 782	
t_2 = –23.026 888 916	**B**	T_2 = –62.382 360 032	
t_3 = –12.906 252 608		T_3 = –33.711 062 282	
t_4 = –2.785 616 300		T_4 = –24.153 963 032	
t_5 = 7.335 020 008		T_5 = –14.596 863 782	
t_6 = 17.455 656 316	U ⇒ H_o = 72km/s/mpc	T_6 = –5.039 764 532	
t_7 = 27.576 292 624		T_7 = 4.517 334 718	
$t_1 - T_3 = (\alpha\mu)^{1/2}$		T_8 = 14.074 433 968	
$t_2 - T_4 = (\alpha\mu)$			
$t_3 - T_5 = (\alpha\mu)^{3/2}$		T_9 = 23.631 533 218	
$t_4 - T_6 = (\alpha\mu)^2$			

NUMVAL2.WPD

June 23, 2008

S.I. NUMERICAL VALUES

$\log_{10}$(m,kg,s) values

FUNDAMENTAL CONSTANTS:

NEWTON'S CONSTANT	G =	-10.175 295 619	$[L^3/MT^2]$
PLANCK'S CONSTANT	$\hbar$ =	-33.976 923 930	$[ML^2/T]$
VELOCITY OF LIGHT	c =	8.476 820 703	[L/T]
PROTON MASS/ELECTRON MASS	μ =	3.263 908 788	[0]
FINE STRUCTURE CONSTANT	α =	-2.136 834 673	[0]
COULOMB/GRAVITY FORCE RATIO	S =	39.355 471 115	[0]
	$\alpha\mu$ =	1.127 074 115	[0]

PLANCK VALUES:

PLANCK MASS	$m_o = \sqrt{c\hbar/G}$ =	-7.662 403 804	[M]	
PLANCK LENGTH	$l_o = \sqrt{G\hbar/c^3}$ =	-34.791 340 829	[L]	
PLANCK TIME	$t_o = \sqrt{G\hbar/c^5}$ =	-43.268 161 532	[T]	
	c/G =	18.652 116 322	$[MT/L^2]$	
SCHWARTZSCHILD BOUND	c^2/G =	27.128 937 025	[M/L]	m_o/l_o
TIME FACTOR	c^3/G =	35.605 757 728	[M/T]	
PLANCK FORCE	c^4/G =	44.082 578 431	$[ML/T^2]$	
PLANCK POWER	c^5/G =	52.559 399 134	$[ML^2/T^3]$	
PLANCK ENERGY	$\sqrt{\hbar c^5/G}$ =	9.291 237 602	$[ML^2/T^2]$	
"	$\sqrt{\hbar c^5/G}$ =	$m_oc^2 = Gm_o^2/l_o = \hbar/t_o$	$[ML^2/T^2]$	
PLANCK DENSITY	$c^5/\hbar G^2$ =	96.711 618 683	$[M/L^3]$	
$[\text{PLANCK CHARGE}]^2$	$\hbar c$ =	-25.500 103 227	$[ML^3/T^2]$	
$m_o \cdot l_o$	$\hbar/c$ =	-42.453 744 633	[ML]	
$m_o \cdot t_o$	$\hbar/c^2$ =	-50.930 565 336	[MT]	

BARYON VALUES:

PROTON MASS	m_p =	-26.776 602 304	[M]	
NEUTRON MASS	m_n =	-26.776 004 075	[M]	
ELECTRON MASS	m_e =	-30.040 511 092	[M]	
ELECTRON RADIUS	r_e =	-14.550 068 214	[L]	
ELECTRON FREQUENCY	c/r_e =	+23.026 888 917	[1/T]	
$[\text{ELECTRON CHARGE}]^2$	$\hbar\alpha c$ =	-27.636 937 900	$[ML^3/T^2]$	e^2

POWERS AND ROOTS:

c	8.476 820 703	l_o	–34.791 340 829	r_e	–14.550 068 214
	16.953 641 406	l_o^2	-69.582 681 658	r_e^2	-29.100 136 428
	25.430 462 109	l_o^3	-104.374 022 487	r_e^3	-43.650 204 642
	33.907 282 812	l_o^4	-139.165 363 316	r_e^4	-58.200 272 856
	42.384 103 515	l_o^5	-173.956 704 145	r_e^5	-72.750 341 07
	50.860 924 218	l_o^6	-208.748 044 974	r_e^6	-87.300 409 284
	59.337 744 921	l_o^7	-243.539 385 803	r_e^7	-101.850 477 498
	67.814 565 624	l_o^8	-278.330 726 632	r_e^8	-116.400 545 712
	76.291 386 327	l_o^9	-313.122 067 461	r_e^9	-130.950 613 926
	84.768 207 03	l_o^{10}	-347.913 408 29	r_e^{10}	-145.500 682 14

TEMPLATE VALUES

$S^{1/2}$	=	19.677 735 557		$(\alpha\mu)^{1/2}$	=	0.563 537 057
S	=	39.355 471 115	= $\alpha^{-23}\mu^{-3}$	$(\alpha\mu)$	=	1.127 074 115
$S^{3/2}$	=	59.033 206 671		$(\alpha\mu)^{3/2}$	=	1.690 611 171
S^2	=	78.710 942 230	= $\alpha^{-46}\mu^{-6}$	$(\alpha\mu)^2$	=	2.254 148 230
$S^{5/2}$	=	98.388 677 785		$(\alpha\mu)^{5/2}$	=	2.817 685 288
S^3	=	118.066 413 342	= $\alpha^{-69}\mu^{-9}$	$(\alpha\mu)^3$	=	3.381 222 342
$S^{7/2}$	=	137.744 148 899		$(\alpha\mu)^{7/2}$	=	3.944 759 403
S^4	=	157.421 884 456	= $\alpha^{-92}\mu^{-12}$	$(\alpha\mu)^4$	=	4.508 296 460
$S^{9/2}$	=	177.099 620 013		$(\alpha\mu)^{9/2}$	=	5.071 833 518
S^5	=	196.777 355 570	= $\alpha^{-115}\mu^{-15}$	$(\alpha\mu)^5$	=	5.635 370 575
$S^{11/2}$	=	216.455 091 127		$(\alpha\mu)^{11/2}$	=	6.198 907 633
S^6	=	236.132 826 684	= $\alpha^{-138}\mu^{-18}$	$(\alpha\mu)^6$	=	6.762 444 690
$S^{13/2}$	=	255.810 562 241		$(\alpha\mu)^{13/2}$	=	7.325 981 741
S^7	=	275.488 297 798	= $\alpha^{-161}\mu^{-21}$	$(\alpha\mu)^7$	=	7.889 518 798
$S^{15/2}$	=	295.166 033 355		$(\alpha\mu)^{15/2}$	=	8.453 055 855
S^8	=	314.843 768 912	= $\alpha^{-184}\mu^{-24}$	$(\alpha\mu)^8$	=	9.016 592 912

$(S/\alpha\mu)^{1/4}$	=	9.557 099 250	= $\alpha^{-6}\mu^{-1}$	$(\alpha\mu S)^{1/4}$	=	10.120 636 308	= $\alpha^{-11/2}\mu^{-1/2}$
$(S/\alpha\mu)^{1/2}$	=	19.114 198 500	= $\alpha^{-12}\mu^{-2}$	$(\alpha\mu S)^{1/2}$	=	20.241 272 615	= $\alpha^{-11}\mu^{-1}$
$(S/\alpha\mu)$	=	38.228 397 000	= $\alpha^{-24}\mu^{-4}$	$(\alpha\mu S)$	=	40.482 545 230	= $\alpha^{-22}\mu^{-2}$
$(S/\alpha\mu)^{3/2}$	=	57.342 595 500	= $\alpha^{-36}\mu^{-6}$	$(\alpha\mu S)^{3/2}$	=	60.723 817 845	= $\alpha^{-33}\mu^{-3}$
$(S/\alpha\mu)^{2}$	=	76.456 794 000	= $\alpha^{-48}\mu^{-8}$	$(\alpha\mu S)^{2}$	=	80.965 090 460	= $\alpha^{-44}\mu^{-4}$
$(S/\alpha\mu)^{5/2}$	=	95.570 992 500	= $\alpha^{-60}\mu^{-10}$	$(\alpha\mu S)^{5/2}$	=	101.206 363 075	= $\alpha^{-55}\mu^{-5}$
$(S/\alpha\mu)^{3}$	=	114.685 191 000	= $\alpha^{-72}\mu^{-12}$	$(\alpha\mu S)^{3}$	=	121.447 635 690	= $\alpha^{-66}\mu^{-6}$
$(S/\alpha\mu)^{7/2}$	=	133.799 389 500	= $\alpha^{-84}\mu^{-14}$	$(\alpha\mu S)^{7/2}$	=	141.688 908 305	= $\alpha^{-77}\mu^{-7}$
$(S/\alpha\mu)^{4}$	=	152.913 588 000	= $\alpha^{-96}\mu^{-16}$	$(\alpha\mu S)^{4}$	=	161.930 180 920	= $\alpha^{-88}\mu^{-8}$
$(S/\alpha\mu)^{9/2}$	=	172.027 786 500	= $\alpha^{-108}\mu^{-18}$	$(\alpha\mu S)^{9/2}$	=	182.171 453 535	= $\alpha^{-99}\mu^{-9}$
$(S/\alpha\mu)^{5}$	=	191.141 985 000	= $\alpha^{-120}\mu^{-20}$	$(\alpha\mu S)^{5}$	=	202.412 726 15	= $\alpha^{-110}\mu^{-10}$
$(S/\alpha\mu)^{11/2}$	=	210.256 183 500	= $\alpha^{-132}\mu^{-22}$	$(\alpha\mu S)^{11/2}$	=	222.653 998 765	= $\alpha^{-121}\mu^{-11}$
$(S/\alpha\mu)^{6}$	=	229.370 382 000	= $\alpha^{-144}\mu^{-24}$	$(\alpha\mu S)^{6}$	=	242.895 271 38	= $\alpha^{-132}\mu^{-12}$

$\alpha^{1/2}$	=	−1.068 417 336	$\mu^{1/2}$	=	1.631 954 394	$(\alpha/\mu)^{1/2}$	= −2.700 371 731
α	=	−2.136 834 673	μ	=	3.263 908 788	(α/μ)	= −5.400 743 462
$\alpha^{3/2}$	=	−3.205 252 008	$\mu^{3/2}$	=	4.895 863 182	$(\alpha/\mu)^{3/2}$	= −8.101 115 193
α^{2}	=	−4.273 669 346	μ^{2}	=	6.527 817 576	$(\alpha/\mu)^{2}$	= −10.801 486 924
$\alpha^{5/2}$	=	−5.342 086 680	$\mu^{5/2}$	=	8.159 771 970	$(\alpha/\mu)^{5/2}$	= −13.501 858655
α^{3}	=	−6.410 504 016	μ^{3}	=	9.791 726 364	$(\alpha/\mu)^{3}$	= −16.202 230 386
$\alpha^{7/2}$	=	−7.478 921 352	$\mu^{7/2}$	=	11.423 680 758	$(\alpha/\mu)^{7/2}$	= −18.902 602 117
α^{4}	=	−8.547 338 688	μ^{4}	=	13.055 635 152	$(\alpha/\mu)^{4}$	= −21.602 973 848
$\alpha^{9/2}$	=	−9.615 756 024	$\mu^{9/2}$	=	14.687 589 546	$(\alpha/\mu)^{9/2}$	= −24.303 345 579
α^{5}	=	−10.684 173 36	μ^{5}	=	16.319 543 940	$(\alpha/\mu)^{5}$	= −27.003 717 310
$\alpha^{11/2}$	=	−11.752 590 696	$\mu^{11/2}$	=	17.951 498 334	$(\alpha/\mu)^{11/2}$	= −29.704 089 041
α^{6}	=	−12.821 008 032	μ^{6}	=	19.583 452 728	$(\alpha/\mu)^{6}$	= −32.404 460 772
$\alpha^{13/2}$	=	−13.889 425 368	$\mu^{13/2}$	=	21.215 407 122	$(\alpha/\mu)^{13/2}$	= −35.104 832 503
α^{7}	=	−14.957 842 704	μ^{7}	=	22.847 361 516	$(\alpha/\mu)^{7}$	= −37.805 204 234
$\alpha^{15/2}$	=	−16.026 260 004	$\mu^{15/2}$	=	24.479 315 910	$(\alpha/\mu)^{15/2}$	= −40.505 575 965
α^{8}	=	−17.094 677 376	μ^{8}	=	26.111 270 304	$(\alpha/\mu)^{8}$	= −43.205 947 696

NOTES:

fermi	r_e	= −14.550 068 214	$\hbar\alpha/m_e c$	[L]
compton wave length	λ_c	= −12.413 233 541	$\hbar/m_e c$	[L]
bohr radius	a_o	= −10.276 398 868	$\hbar/m_e c\alpha$	[L]
rydberg *	r_∞^{-1}	= −8.139 564 195	$\hbar/m_e c\alpha^2$	[L]

Each of the above lengths differ by α.

*The Rydberg constant $R_\infty = m_e c\,\alpha^2/4\pi\hbar$ = 5.040 354 331 [L^{-1}].
The above quantity $r_\infty^{-1} = \hbar/m_e c\alpha^2$. (i.e.no 4π) [L]

WOLFRAM ALPHA DATA 9-5-22 DOWN LOAD

Proton
~~Planck~~ Mass 7.685×10^{-20} Planck mass = −19.114 356 13 ✓

1 planck mass = 1.301×10^{19} proton mass = 19.114 277 297 ✓

Proton mass =

Plank length l_0

l_0 = 5.735×10^{-21} re −20.241 466 58 ✓

$re = 1.743 \times 10^{21}\ l_0$ 21.241 297 387 ✗

Planck time t_0

1.351×10^{-43} sec −42.869 344 65 ✗

3.112×10^{-43} sec −42.506 900 41 ✗

N_A Avogadro's Number

6.022142×10^{23} — 23.779 750 992

83.298 511

① Mass = $1.988\,435 \times 10^{33}$ g ✓

Surface Temp = 5780

radius = 432,200 miles

$(\alpha MS)^{3/2} t_0$ = 17.455 656 813

9.956 552

antilog 9.047 488 4

9.047 987 668 × 3/2

~~Age~~ 13.571 9815 y

Age of Universe 13.7×10^9 y

4.32×10^{17} sec

Hubble Const 70 km/sec/mpc

$= 17.635\,484$ sec

March 9, 2008

Age = $13.73 \times 10^9 \pm 120 \times 10^6$ y

4.33×10^{17} sec

3.1 × age of ⊕

1.4 × age of ⊙

Age $\times 10^9$ y

13.7

13.73

13.76

$Es = 32 \times 10^9$ y

Age of univ = 0.43 Es = 13.76 B.Y

9.173

13.58?

~~16.672 937 sec~~

Φ^{-1} 0.618033989

Φ $= 2.618033989 - 1$

Φ 1.618033989

$\sqrt{\Phi}$ 1.27201965

$\sqrt[4]{\Phi}$ 1.127838486

Φ^{-2} 0.381966011

( )$^{-8}$ = 0.384 199

$(5-\sqrt{15})^8$ = 2.602 841 212

$(5-\sqrt{15})^4$ = 1.613 323 034

$(5-\sqrt{15})^2$ = 1.270 166 54

$5-\sqrt{15}$ = 1.127 016 654

$(5-\sqrt{15})^{-1}$ = 0.887 298 335

$(\frac{4}{\pi})^4$ = 2.628 091 857

$(\frac{4}{\pi})^2$ = 1.621 139 38

$\frac{4}{\pi}$ = 1.27 323 4545

$\sqrt{\frac{4}{\pi}}$ = 1,128 379 167

$\sqrt{\frac{4}{\pi}} \doteq \sqrt[4]{\Phi}$ $\delta = 0.000541$

1,127 838
1,128 379
0.000 541

$\frac{4}{\pi}$ w$\sqrt{\Phi}$

1,273 235
1,272 020
0.000 215

$\sqrt[4]{\Phi}$ = 1.127 838

$5-\sqrt{15}$ = 1.127 017

$\sqrt{\frac{4}{\pi}}$ = 1.128 379

$\alpha\mu$ = 1.127 074

$\alpha\mu$ = 1.127074

$5-\sqrt{15}$ 1.127017

0.000057

2-5 # 2661