Einstein's Relativity Coffin nail # 9

Year 2006 Case NV CMa binary stars apsidal motion

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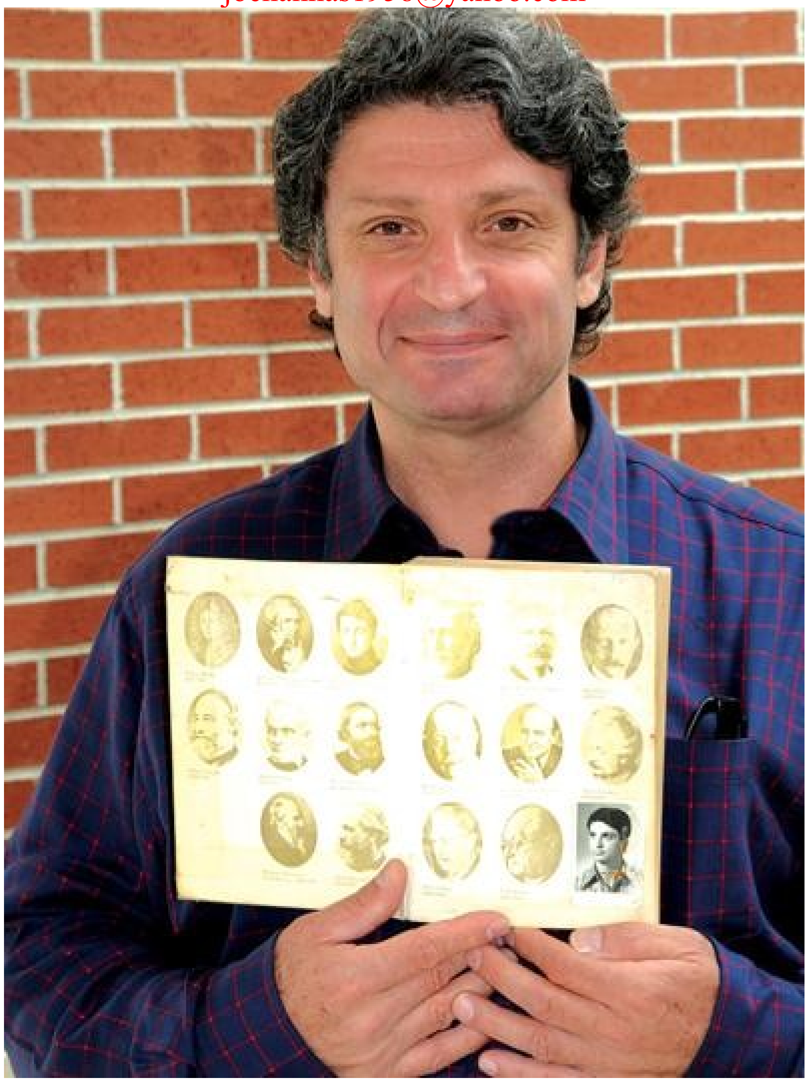

This is me Joe Nahhas founder of real time physics July 4th 1973.

Here is me in year 2009 showing my 1979 thermo book with my picture stapled next to most notable Physicists of past 350 years whispering; it is not only Einstein is wrong but physics is wrong for past 350 years. It is time for change; regime change. It is time to end the western Royals Imperials and Corporate Physicists monopoly on physics taught and learned in past 350 years is at least 51 % wrong and Modern Physics is at least 88.88 % silly and because there is better physics and better physics is real time physics.

The elimination of relativity theory and annexation of quantum mechanics to classical mechanics is a matter of time and not a matter of science because time is a scale and not a dimension. A measurement is an event taken in present time of an event that happened in the past. We measure what is happening live in present time of what had already happened in past time.
Present time = present time
Present time = past time + [present time - past time]
Present time = past time + the difference between past time and present time
Measurement time = event time + time delays
Experiment = theory + corrections
Real time physics = event time physics + delay time physics

Applied to Planetary motion or star-star motion

An event: $r(\theta, 0) = [a(1-\varepsilon^2)/(1+\varepsilon \text{ cosine } \theta)]$ Planet motion **Event**
Time factor $\{e^{[\lambda(r) + i\omega(r)]t}\}$
Physics live: $r(\theta, t) = [a(1-\varepsilon^2)/(1+\varepsilon \text{ cosine } \theta)]\{e^{[\lambda(r) + i\omega(r)]t}\}$
Perihelion advance **corrections**:
$$W''(ob) = (-720 \times 36526 \times 3600/T)\{[\sqrt{(1-\varepsilon^2)}]/(1-\varepsilon)^2\}[(v^* + v^\circ)/c]^2$$
$$= 43.11'' \text{ of an arc per century for mercury}$$

"The silly notion of time as a dimension can be sent back to sender"

Abstract: This is the solution to the 150 years apsidal motion puzzle solution that is not solvable by space-time physics or any said or published physics including 109 years of noble prize winner physics and 400 years of astronomy. Binary stars apsidal motion or "Apparent" rate of orbital axial rotation is projected light aberrations visual effects along the line of sight of moving objects applied to the angular velocity at Apses. From the thousands of close binary stars astronomers picked a dozen sets of binary stars systems that would be a good test of relativity theory and collected data for all past century and relativity theory failed every one of them. This rate of "apparent" axial rotation is given by this new equation
$W^\circ(ob) = (-720 \times 36526/T)\{[\sqrt{(1-\varepsilon^2)}]/(1-\varepsilon)^2]\}[(v^\circ + v^*)/c]^2$ degrees/100 years
T = period; ε = eccentricity; v° = spin velocity effect; v^*= orbital velocity effect
When applied to NV Canis Majoris binary stars
Apsidal period of U = 1757.5 years

Real time universal mechanics solution

All there is in the Universe is objects of mass m moving in space (x, y, z) at a location $\mathbf{r} = \mathbf{r}(x, y, z)$. The state of any object in the Universe can be expressed as the product
<u>$\mathbf{S} = m\mathbf{r}$; State = mass x location:</u>

$\mathbf{P} = d\mathbf{S}/dt = m(d\mathbf{r}/dt) + (dm/dt)\mathbf{r}$ = Total moment
= change of location + change of mass

$= m v + m' r$; v = velocity $= d r/d t$; m' = mass change rate

$\mathbf{F} = d\,\mathbf{P}/d t = d^2\mathbf{S}/dt^2$ = Total force

$= m (d^2\mathbf{r}/dt^2) + 2(dm/d t) (d\,\mathbf{r}/d t) + (d^2m/dt^2)\,\mathbf{r}$

$= m\,\boldsymbol{\gamma} + 2m'\mathbf{v} + m''\,\mathbf{r}$; γ = acceleration; m'' = mass acceleration rate

<u>In polar coordinates system</u>

We Have $\mathbf{r} = r\,\mathbf{r}_{(1)}$; $\mathbf{v} = r'\,\mathbf{r}_{(1)} + r\,\theta'\,\boldsymbol{\theta}_{(1)}$; $\boldsymbol{\gamma} = (r'' - r\theta'^2)\mathbf{r}_{(1)} + (2r'\theta' + r\,\theta'')\boldsymbol{\theta}_{(1)}$

$\mathbf{r}$ = location; $\mathbf{v}$ = velocity; $\boldsymbol{\gamma}$ = acceleration

$\mathbf{F} = m\,\boldsymbol{\gamma} + 2m'\mathbf{v} + m''\,\mathbf{r}$

$\mathbf{F} = m\,[(r''-r\theta'^2)\,\mathbf{r}_{(1)} + (2r'\theta' + r\,\theta'')\,\boldsymbol{\theta}_{(1)}] + 2m'[r'\,\mathbf{r}_{(1)} + r\,\theta'\,\boldsymbol{\theta}_{(1)}] + (m''\,r)\,\mathbf{r}_{(1)}$

$= [d^2 (m\,r)/dt^2 - (m\,r)\,\theta'^2]\,\mathbf{r}_{(1)} + (1/mr)\,[d\,(m^2r^2\theta')/d\,t]\,\boldsymbol{\theta}_{(1)}$

$= [-GmM/r^2]\,\mathbf{r}_{(1)}$ -------------------------------- Newton's Gravitational Law

Proof**:**

First $\mathbf{r} = r\,[\text{cosine}\,\theta\,\hat{\mathbf{i}} + \text{sine}\,\theta\,\hat{\mathbf{J}}] = r\,\mathbf{r}_{(1)}$

Define $\mathbf{r}_{(1)} = \text{cosine}\,\theta\,\hat{\mathbf{i}} + \text{sine}\,\theta\,\hat{\mathbf{J}}$

Define $\mathbf{v} = d\,\mathbf{r}/d\,t = r'\,\mathbf{r}_{(1)} + r\,d[\mathbf{r}_{(1)}]/d\,t$

$= r'\,\mathbf{r}_{(1)} + r\,\theta'[-\,\text{sine}\,\theta\,\hat{\mathbf{i}} + \text{cosine}\,\theta\hat{J}]$

$= r'\,\mathbf{r}_{(1)} + r\,\theta'\,\boldsymbol{\theta}_{(1)}$

Define $\boldsymbol{\theta}_{(1)} = -\text{sine}\,\theta\,\hat{i} + \text{cosine}\,\theta\,\hat{J}$;

And with $\mathbf{r}_{(1)} = \text{cosine}\,\theta\,\hat{i} + \text{sine}\,\theta\,\hat{J}$

Then $d\,[\boldsymbol{\theta}_{(1)}]/d\,t = \theta'\,[-\,\text{cosine}\,\theta\,\hat{i} - \text{sine}\,\theta\,\hat{J} = -\,\theta'\,\mathbf{r}_{(1)}$

And $d\,[\mathbf{r}_{(1)}]/d\,t = \theta'\,[-\text{sine}\,\theta\,\hat{i} + \text{cosine}\,\theta\,\hat{J}] = \theta'\,\boldsymbol{\theta}_{(1)}$

Define $\boldsymbol{\gamma} = d\,[r'\,\mathbf{r}_{(1)} + r\,\theta'\,\boldsymbol{\theta}_{(1)}]\,/d\,t$

$= r''\,r_{(1)} + r'd\,[\mathbf{r}_{(1)}]/d\,t + r'\,\theta'\,\mathbf{r}_{(1)} + r\,\theta''\,\mathbf{r}_{(1)} + r\,\theta'd\,[\theta_{(1)}]/d\,t$

$\boldsymbol{\gamma} = (r'' - r\theta'^2)\,\mathbf{r}_{(1)} + (2r'\theta' + r\,\theta'')\,\boldsymbol{\theta}_{(1)}$

With $d^2 (m\,r)/dt^2 - (m\,r)\,\theta'^2 = -GmM/r^2$	Newton's Gravitational Equation	(1)
And $d\,(m^2r^2\theta')/d\,t = 0$	Central force law	(2)

<u>(2)</u>: $d\,(m^2r^2\theta')/d\,t = 0$

Then $m^2r^2\theta'$ = constant

$= H\,(0, 0)$

$= m^2\,(0, 0)\,h\,(0, 0)$; $h\,(0, 0) = r^2\,(0, 0)\,\theta'(0, 0)$

$= m^2\,(0, 0)\,r^2\,(0, 0)\,\theta'(0, 0)$; $h\,(\theta, 0) = [r^2\,(\theta, 0)]\,[\theta'(\theta, 0)]$

$= [m^2\,(\theta, 0)]\,h\,(\theta, 0)$; $h\,(\theta, 0) = [r^2\,(\theta, 0)]\,[\theta'(\theta, 0)]$

$= [m^2\,(\theta, 0)]\,[r^2\,(\theta, 0)]\,[\theta'(\theta, 0)]$

$= [m^2\,(\theta, t)]\,[r^2\,(\theta, t)]\,[\theta'\,(\theta, t)]$

$= [m^2(\theta, 0)\,m^2(0,t)][\,r^2(\theta,0)r^2(0,t)][\theta'(\theta, t)]$

$= [m^2(\theta, 0)\,m^2(0,t)][\,r^2(\theta,0)r^2(0,t)][\theta'(\theta, 0)\,\theta'\,(0, t)]$

With $m^2r^2\theta'$ = constant

Differentiate with respect to time

Then $2mm'r^2\theta' + 2m^2rr'\theta' + m^2r^2\theta'' = 0$
Divide by $m^2r^2\theta'$
Then $2 (m'/m) + 2(r'/r) + \theta''/\theta' = 0$
This equation will have a solution $2 (m'/m) = 2[\lambda (m) + ì\, \omega (m)]$
And $2(r'/r) = 2[\lambda (r) + ì\, \omega (r)]$
And $\theta''/\theta' = -2\{\lambda (m) + \lambda (r) + ì\, [\omega (m) + \omega (r)]\}$

Then $(m'/m) = [\lambda (m) + ì\, \omega (m)]$
Or $d m/m\, d t = [\lambda (m) + ì\, \omega (m)]$
And $dm/m = [\lambda (m) + ì\, \omega (m)]\, d t$
Then $m = m (0)\, e^{[\lambda (m) + ì\, \omega (m)]\, t}$

$m = m (0)\, m (0, t);\ m (0, t)\, e^{[\lambda (m) + ì\, \omega (m)]\, t}$

With initial spatial condition that can be taken at $t = 0$ anywhere then $m (0) = m (\theta, 0)$
And $m = m (\theta, 0)\, m (0, t) = m (\theta, 0)\, e^{[\lambda (m) + ì\, \omega (m)]\, t}$
And $m (0, t) = e^{[\lambda (m) + ì\, \omega (m)]\, t}$
Similarly we can get
Also, $r = r (\theta, 0)\, r (0, t) = r (\theta, 0)\, e^{[\lambda (r) + ì\, \omega (r)]\, t}$
With $r (0, t) = e^{[\lambda (r) + ì\, \omega (r)]\, t}$
Then $\theta'(\theta, t) = \{H(0, 0)/[m^2(\theta,0)\, r(\theta,0)]\}e^{-2\{[\lambda(m) + \lambda(r)] + ì\, [\omega(m) + \omega(r)]\}t}$ -----I
And $\theta'(\theta, t) = \theta' (\theta, 0)]\, e^{-2\{[\lambda (m) + \lambda(r)] + ì\, [\omega (m) + \omega (r)]\}\, t}$ ------------------------I
And, $\theta'(\theta, t) = \theta' (\theta, 0)\, \theta' (0, t)$
And $\theta' (0, t) = e^{-2\{[\lambda (m) + \lambda (r)] + ì\, [\omega (m) + \omega(r)]\}\, t}$
Also $\theta'(\theta, 0) = H (0, 0)/ m^2 (\theta, 0)\, r^2 (\theta, 0)$
And $\theta'(0, 0) = \{H (0, 0)/ [m^2 (0, 0)\, r (0, 0)]\}$

With (1): $d^2 (m r)/dt^2 - (m r)\, \theta'^2 = -GmM/r^2 = -Gm^3M/m^2r^2$
And $d^2 (m r)/dt^2 - (m r)\, \theta'^2 = -Gm^3 (\theta, 0)\, m^3 (0, t)\, M/ (m^2r^2)$
Let $m r =1/u$
Then $d (m r)/d t = -u'/u^2 = - (1/u^2) (\theta')\, d u/d \theta = (- \theta'/u^2)\, d u/d \theta = -H\, d u/d \theta$
And $d^2 (m r)/dt^2 = -H\theta'd^2u/d\theta^2 = - Hu^2 [d^2u/d\theta^2]$

$-Hu^2 [d^2u/d\theta^2] - (1/u) (Hu^2)^2 = -Gm^3 (\theta, 0)\, m^3 (0, t)\, Mu^2$
$[d^2u/ d\theta^2] + u = Gm^3 (\theta, 0)\, m^3 (0, t)\, M/ H^2$

$t = 0;\ m^3 (0, 0) = 1$
$u = Gm^3 (\theta, 0)\, M/ H^2 + A \text{ cosine } \theta =Gm (\theta, 0)\, M (\theta, 0)/ h^2 (\theta, 0)$

And $m r = 1/u = 1/ [Gm (\theta, 0)\, M (\theta, 0)/ h (\theta, 0) + A \text{ cosine } \theta]$
$= [h^2/ Gm (\theta, 0)\, M (\theta, 0)]/ \{1 + [Ah^2/ Gm (\theta, 0)\, M (\theta, 0)]\, [\text{cosine } \theta]\}$
$= [h^2/Gm (\theta, 0)\, M (\theta, 0)]/ (1 + \varepsilon \text{ cosine } \theta)$

Then $m (\theta, 0)\, r (\theta, 0) = [a (1-\varepsilon^2)/ (1+ \varepsilon \text{ cosine } \theta)]\, m (\theta, 0)$
Dividing by $m (\theta, 0)$

Then $r(\theta, 0) = a(1-\varepsilon^2)/(1+\varepsilon \text{ cosine } \theta)$

This is Newton's Classical Equation solution of two body problem which is the equation of an ellipse of semi-major axis of length a and semi minor axis $b = a\sqrt{(1-\varepsilon^2)}$ and focus length $c = \varepsilon a$

And $m\, r = m(\theta, t)\, r(\theta, t) = m(\theta, 0)\, m(0, t)\, r(\theta, 0)\, r(0, t)$

Then, $r(\theta, t) = [a(1-\varepsilon^2)/(1+\varepsilon \text{ cosine } \theta)]\, e^{[\lambda(r) + i\,\omega(r)]\, t}$--------------------------- II

This is Newton's time dependent equation that is missed for 350 years

If $\lambda(m) \approx 0$ fixed mass and $\lambda(r) \approx 0$ fixed orbit; then

Then $r(\theta, t) = r(\theta, 0)\, r(0, t) = [a(1-\varepsilon^2)/(1+\varepsilon \text{ cosine } \theta)]\, e^{i\,\omega(r)\, t}$

And $m = m(\theta, 0)\, e^{+i\,\omega(m)\, t} = m(\theta, 0)\, e^{i\,\omega(m)\, t}$

We Have $\theta'(0, 0) = h(0, 0)/r^2(0, 0) = 2\pi ab/\, Ta^2(1-\varepsilon)^2$

$= 2\pi a^2 [\sqrt{(1-\varepsilon^2)}]/T\, a^2(1-\varepsilon)^2$

$= 2\pi [\sqrt{(1-\varepsilon^2)}]/T(1-\varepsilon)^2$

Then $\theta'(0, t) = \{2\pi [\sqrt{(1-\varepsilon^2)}]/\, T(1-\varepsilon)^2\}\ \text{Exp}\ \{-2[\omega(m) + \omega(r)]\, t$

$= \{2\pi [\sqrt{(1-\varepsilon^2)}]/\, (1-\varepsilon)^2\}\ \{\text{cosine } 2[\omega(m) + \omega(r)]\, t - i \sin 2[\omega(m) + \omega(r)]\, t\}$

$= \theta'(0, 0)\ \{1 - 2\sin^2 [\omega(m) + \omega(r)]\, t\}$

$- 2i\, \theta'(0, 0) \sin [\omega(m) + \omega(r)]\, t \text{ cosine } [\omega(m) + \omega(r)]\, t$

Then $\theta'(0, t) = \theta'(0, 0)\ \{1 - 2\text{sine}^2 [\omega(m)\, t + \omega(r)\, t]\}$

$- 2i\, \theta'(0, 0) \sin [\omega(m) + \omega(r)]\, t \text{ cosine } [\omega(m) + \omega(r)]\, t$

$\Delta\theta'(0, t) \quad = \text{Real } \Delta\theta'(0, t) + \text{Imaginary } \Delta\theta(0, t)$

$\text{Real } \Delta\theta(0, t) = \theta'(0, 0)\ \{1 - 2 \text{ sine}^2 [\omega(m)\, t\, \omega(r)\, t]\}$

Let $W(\text{cal}) = \Delta\theta'(0, t)\ (\text{observed}) = \text{Real } \Delta\theta(0, t) - \theta'(0, 0)$

$= -2\theta'(0, 0) \text{ sine}^2 [\omega(m)\, t + \omega(r)\, t]$

$= -2[2\pi [\sqrt{(1-\varepsilon^2)}]/T(1-\varepsilon)^2] \text{ sine}^2 [\omega(m)\, t + \omega(r)\, t]$

And $W(\text{cal}) = -4\pi [\sqrt{(1-\varepsilon^2)}]/T(1-\varepsilon)^2] \text{ sine}^2 [\omega(m)\, t + \omega(r)\, t]$

<u>If this apsidal motion is to be found as visual effects</u>, then

With, $v°$ = spin velocity; v^* = orbital velocity; $v°/c = \tan \omega(m)\, T°$; $v^*/c = \tan \omega(r)\, T^*$

Where $T°$ = spin period; T^* = orbital period

And $\omega(m)\, T° = \text{Inverse tan } v°/c$; $\omega(r)\, T^* = \text{Inverse tan } v^*/c$

$W(\text{ob}) = -4\pi [\sqrt{(1-\varepsilon^2)}]/T(1-\varepsilon)^2] \text{ sine}^2 [\text{Inverse tan } v°/c + \text{Inverse tan } v^*/c]$ radians

Multiplication by $180/\pi$

$W(\text{ob}) = (-720/T)\ \{[\sqrt{(1-\varepsilon^2)}]/\, (1-\varepsilon)^2\}\ \text{sine}^2\ \{\text{Inverse tan } [v°/c + v^*/c]/\, [1 - v°\, v^*/c^2]\}$ degrees and multiplication by 1 century = 36526 days and using T in days

$W°(\text{ob}) = (-720 \times 36526/T\text{days})\ \{[\sqrt{(1-\varepsilon^2)}]/\, (1-\varepsilon)^2\} \times$

$\text{sine}^2\ \{\text{Inverse tan } [v°/c + v^*/c]/\, [1 - v°\, v^*/c^2]\}$ degrees/100 years

Approximations I

With $v° << c$ and $v* << c$, then $v° v* <<< c^2$ and $[1 - v° v*/c^2] \approx 1$
Then $W° (ob) \approx (-720x36526/Tdays) \{[\sqrt{(1-\varepsilon^2)}]/ (1-\varepsilon)^2\}$ x sine² Inverse tan $[v°/c + v*/c]$ degrees/100 years

Approximations II
With $v° << c$ and $v* << c$, then sine Inverse tan $[v°/c + v*/c] \approx (v° + v*)/c$
$W° (ob) = (-720x36526/Tdays) \{[\sqrt{(1-\varepsilon^2)}]/ (1-\varepsilon)^2\} \times [(v° + v*)/c]^2$ degrees/100 years
This is the equation that gives the correct apsidal motion rates -----------------------III

The circumference of an ellipse: $2\pi a (1 - \varepsilon^2/4 + 3/16(\varepsilon^2)^2 - --.) \approx 2\pi a (1-\varepsilon^2/4)$; $R = a (1-\varepsilon^2/4)$
Where $v (m) = \sqrt{[GM^2/ (m + M) a (1-\varepsilon^2/4)]}$
And $v (M) = \sqrt{[Gm^2 / (m + M) a (1-\varepsilon^2/4)]}$
Looking from top or bottom at two stars they either spin in clock (↑) wise or counter clockwise (↓)
Looking from top or bottom at two stars they either approach each other coming from the top (↑) or from the bottom (↓)
Knowing this we can construct a table and see how these two stars are formed. There are many combinations of velocity additions and subtractions and one combination will give the right answer.

1- Advance of Perihelion of mercury. [No spin factor] Because data are given with no spin factor

$G=6.673x10^{-11}$; $M=2x\ 10^{30}kg$; $m=.32x10^{24}kg$; $\varepsilon = 0.206$; T=88days
And c = 299792.458 km/sec; a = 58.2km/sec; $1-\varepsilon^2/4 = 0.989391$
With v° = 2meters/sec
And $v *= \sqrt{[GM/a (1-\varepsilon^2/4)]} = 48.14$ km/sec
Calculations yields: $v = v* + v° = 48.14$km/sec (mercury)
And $[\sqrt{(1- \varepsilon^2)}] (1-\varepsilon)^2 = 1.552$
$W'' (ob) = (-720x36526x3600/T) \{[\sqrt{(1-\varepsilon^2)}]/ (1-\varepsilon)^2\} (v/c)^2$
$W'' (ob) = (-720x36526x3600/88) \times (1.552) (48.14/299792)^2 = 43.0$"/century

This is the rate of for the advance of perihelion of planet mercury explained as "apparent" without the use of fictional forces or fictional universe of space-time confusions of physics of relativity.

Venus Advance of perihelion solution:

$W'' (ob) = (-720x36526x3600/T) \{[\sqrt{(1-\varepsilon^2)}]/ (1-\varepsilon)^2\} [(v°+ v*)/c]^2$ seconds/100 years

Data: T=244.7days $v°= v° (p)] = 6.52$km/sec; $\varepsilon = 0.0.0068$; $v*(p) = 35.12$
Calculations

$1-\varepsilon = 0.0068$; $(1-\varepsilon^2/4) = 0.99993$; $[\sqrt{(1-\varepsilon^2)}] / (1-\varepsilon)^2 = 1.00761$

$G=6.673x10^{-11}$; $M_{(0)} = 1.98892x19^{30}kg$; $R = 108.2x10^9m$

$V^*(p) = \sqrt{[GM^2/(m + M) a (1-\varepsilon^2/4)]} = 41.64$ km/sec

Advance of perihelion of Venus motion is given by this formula:

$$W''(ob) = (-720x36526x3600/T) \{[\sqrt{(1-\varepsilon^2)}]/ (1-\varepsilon)^2]\} [(v^\circ + v^*)/c]^2 \text{ seconds/100 years}$$

$$W''(ob) = (-720x36526x3600/T) \{[\sqrt{(1-\varepsilon^2)}]/ (1-\varepsilon)^2\} \sin^2 [\text{Inverse tan } 41.64/300{,}000]$$
$$= (-720x36526x3600/224.7) (1.00762) (41.64/300{,}000)^2$$

W" (observed) = 8.2"/100 years; observed 8.4"/100years

This is a proof that not only space-time physicists are incompetent liars but it does not require fictional forces or universes to example an insignificant issue of advance of perihelion which says that every 301395.3488 years Mercury does one extra run around mother sun

Looking from top or bottom at two stars they either spin in clock (↑) wise or counter clockwise (↓)

Looking from top or bottom at two stars they either approach each other coming from the top (↑) or from the bottom (↓)

Knowing this we can construct a table and see how these two stars are formed. There are many combinations of velocity additions and subtractions and one combination will give the right answer.

NV CMa Binary stars apsidal motion table

Primary → Secondary ↓	$v°(p) \uparrow v^*(p)\uparrow$	$v°(p) \uparrow v^*(p)\downarrow$	$v°(p) \downarrow v^*(p) \uparrow$	$v°(p) \downarrow V^*(p) \downarrow$
$v°(s) \uparrow v^*(s)\uparrow$	Spin=[↑,↑] [↑,↑]=orbit	[↑,↑][↓,↑]	[↓,↑][↑,↑]	[↓,↑][↓,↑]
Spin results	$v°(p) + v°(s)$	$v°(p) + v°(s)$	$- v°(p) + v°(s)$	$-v°(p) + v°(s)$
Orbit results	$v^*(p) + v^*(s)$	$-v^*(p) + v^*(s)$	$v^*(p) + v^*(s)$	$-v^*(p) + v^*(s)$
Examples	NV CMa			
$v°(s) \uparrow v^*(s)\downarrow$	[↑,↑][↑,↓]	[↑,↑][↓,↓]	[↓,↑][↑,↓]	[↓,↑][↓,↓]
Spin results	$v°(p) + v°(s)$	$v°(p) + v°(s)$	$-v°(p) + v°(s)$	$-v°(p) + v°(s)$
Orbit results	$v^*(p) - v^*(s)$	$-v^*(p) - v^*(s)$	$v^*(p) - v^*(s)$	$-v^*(p) - v^*(s)$
Examples				
$v°(p) \downarrow v^*(s) \uparrow$	[↑,↓][↑,↑]	[↑,↓][↓,↑]	[↓,↓][↑,↑]	[↓,↓][↓,↑]
Spin results	$v°(p) - v°(s)$	$v°(p) - v°(s)$	$-v°(p) - v°(s)$	$-v°(p) - v°(s)$
Orbit results	$v^*(p) + v^*(s)$	$-v^*(p) + v^*(s)$	$v^*(p) + v^*(s)$	$-v^*(p) + v^*(s)$
Examples				
$v°(s) \downarrow V^*(s) \downarrow$	[↑,↓][↑,↓]	[↑,↓][↓,↓]	[↓,↓][↑,↓]	[↓,↓][↓,↓]
Spin results	$v°(p) - v°(s)$	$v°(p) - v°(s)$	$-v°(p) - v°(s)$	$-v°(p) - v°(s)$
Orbit results	$v^*(p) - v^*(s)$	$-v^*(p) - v^*(s)$	$v^*(p) - v^*(s)$	$-v^*(p) - v^*(s)$
Examples				NV CMa

<u>NV CMa apsidal motion solution:</u>

<u>Data:</u> T=1.885159 days; $\varepsilon = 0$; $v^*(p) = 128.55$ km/sec; $v^*(s) = 130.87$ km/sec
$[\sqrt{(1-\varepsilon^2)}] / (1-\varepsilon)^2 = 3.33181$; $v°(p) = 51.7$ km/sec and $v°(s) = 52.4$ km/sec

Apsidal motion is given by this formula:

$W°(ob) = (-720 \times 36526/T) \{[\sqrt{(1-\varepsilon^2)}]/ (1-\varepsilon)^2]\} [(v° + v^*)/c]^2$ degrees/100 years
With $v^* = v^*(p) + v^*(s) = 259.42$ km/sec and $v° = v°(p) + v°(s) = 104.1$
And $v^* + v° = 363.52$ km/sec
$W°(\text{observed}) = (-720 \times 36526/T) \{[\sqrt{(1-\varepsilon^2)}]/ (1-\varepsilon)^2\}$ sine² [Inverse tan 363.52/300,000]
$= (-720 \times 36526/1.885159)\ (1)\ (363.52/300{,}000)^2$
$= 20.48333818°$/century $= 0.2048333818°$/year
U = 360°/0.2048333818°/year;
U = 1757. 5 years

References: Go to Smithsonian/NASA website SAO/NASA and type:
Absolute dimensions NV CMa; Kaluzny, J; Pych, W; Rucinski, S. M; Thompson, I.B

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