Fluid Mechanics: Open Access
ISSN: 2476-2296
Cusack, Fluid Mech Open Acc 2017, 4:1
DOI: 10.4172/2476-2296.1000146
Perspective
OMICS International

Physics for Astro-Theology

Paul T E Cusack*
Independent Researcher, BSc E, DULE, 1641 Sandy Point Rd, Saint John, NB, Canada E2K 5E8, Canada

Abstract

This paper provides some more calculations on the basic Physics of Cusack's Model of the Universe as presented in the previous paper Astro-Theology. Gravity, Space, Energy, Mass are considered. There is a treatment of Waves and the Speed of Light and Arnold's ODE's.

Keywords: Gravity; Waves; Energy; Space; Mass; Atoms; Golden Mean; Universal Constant

Introduction

I present some more basic calculations of Gravity, Space, Energy, and Mass on Cusack's model of the Universe. Waves and the speed of light is touched on briefly as well as the introduction of Cusack's Universal Constant.

Cusack Gravity -Energy- Space Equation

$x^2/a + y^2/b = r^2$

$x^2/8 + y^2/1 = 1$

$0.125x^2 + y^2 = 1$

$y = 1 - 0.3536x$

$dy/dt = v = -0.3536$

$d^2y/dt^2 = a = 0$

$v = d/t = 0.3536 = 0.1334/4/t$

$t = 0.0942$

$d/4 = 0.1334/4 = 0.0333$

$d = vit + 1/2at^2$

$(0.3536)(0.0942) + 0 = 0.0333$

$d = G/2$ But $G = 2$

$d = s = 1$

$E = 1 = s$

$s = 1$, $e = 1$ hypotenuse$=\sqrt{2}$

$E^2 + s^2 = G^2$

$C = 2\pi R$

$2\pi\ (4 + 1/4)/2 = \pi^*\ 4.25$

$d = v_i t + 1/2at^2\ \ 0.1334 = 0.85t + 1/2\ (0.85)t^2 - 0.1334$

$t^2 - t - 0.1334 = 0$

Quadratic

$t = -1.93,\ 06.6$

$t =$ positive 6.6

13 cycles * $t = 13$ * $6.6 = 85.8$ cf 86

$m =$ slope$=3=c$

$\Delta E/\Delta t = dE/dt = c$

$c = 2t - 1$

$t = 2$

$t/0.4083 = 4.898$ cycles

$4.898/12.98$ cycles$=1/2.65$

$2.65/2 = 1.325$

$d\theta/dt = 0.43.49° = \tan^{-1}(12/4) = 0.76$rads

$d\theta/dt = 0.76/dt = 0.1334$

$dt = 13.9358$

$t = 2/13.93 = 0.;1435$

The energy follows a sin curve from -1 to 1 to -1 back to 1 in one cycle. $2\pi/2 = \pi = E$

$E = 1 - 0.125x^2$

Let $x = 0$

$E = 1$

Let $x = 4$

$E = 1 - 0.125(4) = 1 - 2 = -1$

$E = -1$

Ellipse

$x^2/8a + y^2/b = R^2$

$x^2/8 + y^2/1 = 1$

$y^2 = 1 - 0.125x^2$

$E = 1 - 0.125x^2$ $\quad dE/dt = 0 - 0.125(2)x$ $\quad d^2E/dt^2 = -2(0.125) = -0.25 = T/10 =$ Period$=G$ $G = 6.67 = 0.25F$ $G = d^2E/dt^2 F = = aF$

***Corresponding author:** Cusack P, Independent Researcher, BSc E, DULE, 1641 Sandy Point Rd, Saint John, NB, Canada E2K 5E8, Canada. Tel: (506) 214-3313; E-mail: st-michael@hotmail.com

Received December 22, 2016; **Accepted** February 08, 2017; **Published** February 16, 2017

Citation: Cusack PTE (2017) Physics for Astro-Theology. Fluid Mech Open Acc 4: 146. doi: 10.4172/2476-2296.1000146

Citation: Cusack PTE (2017) Physics for Astro-Theology. Fluid Mech Open Acc 4: 146. doi: 10.4172/2476-2296.1000146

F=Ma G=Ma² From above G=Mv² v=a

Now integrating over the length of the line

$\int E=\int[1-0.125X^2]$

$\int E=x-0.125x^3/3$

But x=8

$\int E=8-0.125(8^3)=0.1333=d\theta/dt$

So, Total Energy=s T.E.=s=1-sin 1

$\Omega_1 R=\Omega_2 R$

$d\theta_1/dt\ (4)=d\theta_2\ (1/4)$

$16\ d\theta_1/dt=d\theta^2/dt$

$16\ (0.1334)=2.1344=d\theta_2/dt$

$2.1344/0.4083=5.2275=E_2$ (see C.U.E.)

Energy Acceleration (Gravity)

$F_1/F_2=26.666/426.656=0.0625$

$2*0.0625=1.250=E_{min}$

$E_{min}=x^2-x-1=-1.25$

x=1/2=space (from above)

$G=d^2E/dt^2$=Energy Acceleration=Gravity

$d^2E/dt^2=G=2$

$G_{max}=26.666/4=6.,666[=]$ N/m

At y=3, there are 8 units across the parabola. Since there are 12 dimensions in our universe,

12 * G=12 *6.6667=8 There are 8 nodes in the vibrating drum surface of the Cusack Universal Equation C.U.E.

I think all 12 dimensions can be plotted on this graph adding the derivative 2x-1=0 and

dM/dt=2 , E=1, $E_\rho=4$, $M_\rho=3$, c=3 E=8, m=0, dt/dt=1,s=0.5, dE/dt, dG/dt=2, M=4.486

E/G=E+G

1/0=1+0 true

The Energy in Q/M=0.31514~π/10

∇x E=μ* dH/dt

dθ/dt * (1)= cuz * dH/dt

0.1334=0.4233* dH/dt

dH/dt=π

The "E" in the Cusack Universal Equation is Π this Unites Q/M and Cosmology

If you have a 3 D harmonic oscillator, it would look like a drum across the energy parabola. This is the model used in Q/M. NOTE N=3

∇x E=μ* dH/dt

dθ/dt * (1)= cuz * dH/dt

0.1334=0.4233* dH/dt

dH/dt=π

Waves, Harmonic Oscilators

$E=7=9/2^{6.626}\,\Omega$ Ω= 0.2348=1/cuz 3f=0.4259 f=0.1420 cf 0.858

1.7=0.1429 cf 0.857 7=Eρ+ M_ρ=4+3 (4 loaves 3 fishes, 5 loaves 2 fishes)

f=2/3=6.666=G

Energy Quanta=hΩ

-1.25=6.626 (Ω)

Ω=0.1882=dθ/dt

0.1882/0.0.1334=√ 2

time=1, Energy=1

t x E=√2

Energy Quanta=0=6.626 Ω

Ω=dθ/dt=0

t=1.618+0,.618=2.236

SPACE IS STRETCHED IN 3 D:

0.618^3=1/cuz

This is The Cusack Golden Mean Energy /Gravity Equation: K.E./P.E.=KE+P.E. E/G=E+G E/ d^2E/dt^2= E+d2E/dt This is the Cusack Differential Equation of the Universe E=EG+G² E-E $d^2E/dt^2+(d^2E/dt^2)^2$=36.78=C1=Cusack's first electrodynamic constant.

x=G $x^2-x-1=0$

$[X^2-X-1]/0.618=[X^2-X-1-0.618]$

$X^2-X-1=0.618[X^2-X-1.618]$

$X^2-X-1=618X^2-0.618X-1$

$0.382X^2-0.382X=0$

$X^2-X=0$

$X^2=X$

X=√ X

X=1

E=1=t=1/t

Why are We Constrained by Time More than by Space?

We know from nostradamus that we can travel through time.

DE/DT=1

x^2-x-1

2t-1=1

t=1

1/0.4083=2.449 /s= T=period

2.449=2π * 2.5=15.3886 cf 0.8461

Mass and Energy

M=4.4/E=4.4/1.618=2.719=BASEC e^1

Citation: Cusack PTE (2017) Physics for Astro-Theology. Fluid Mech Open Acc 4: 146. doi: 10.4172/2476-2296.1000146

E=M/base e

Qu=Pi - base e

Qu +base e=πbase e= π -Qu

E=M/[π - Qu]

√c=1/ π -Qu

E=1=√c [π-Qu]

E*[π-Qu]=√ c

E π- E Qu=√c E Qu=²c - Eπ Qu=² c/E - π

Qu= 3 - π Qu=-0.14159

arcsin 0.14159=0.14206 rads=0.0226 of a cycle

$E=Mc^2$

M/base e=Mc^2

1/ base e=c^²

c=sqrt [1]/√[base e]

c=1/1.618=0.618

c=1.618-1

c=conjugate of the golden mean=velocity

base $e^{0.618}$=4.4=MASS

x=1/(x-1) x=1/c 1=E=xc $E=Mc^2$ Mcc=xc Mc=x=1.618

1.618=Mc

Golden Mean= Mass * Velocity

1.618/4.4=1/base e

1.618/M=1/base e

M=1/base e * 1/1.618

M=1/base e *0.618

Mass/[1.618-1]=1/base e

Mass=[E/base e][0.618]

E=M base e *0.618

E=M *1.680 $E=Mc^2$ c=1.296=1.3

c=v==1.296

1.296/0.866=1.49 1/1.49=0.666 evil evil evil

$E=mc^2$=4.4 * 9=39.6

g/39.6=4.03 cf Re=402 (Reynolds's Number)

4.03/402=0.0100

0.0981/0.01=9.81

Gravity

X (1.618)=57.3°/360

X=1.01662

X=0.0984

X/g=0.0984/9.806=0.0100

Now, X(Pi1)/100=y xπ -X=0.0213 X=0.0213/0.0213=1

So,

x/g=0.01 1/g=0.01

g=1/0.01=100

g=100

Ln g=Ln 100=4.61

e4.61=100

4.61 * 0.0213=9.81=g

y=0.0213 e^y=1/y ye^y=1=Energy y Ln e^y=Ln 1=0 y^2=0 y=0 (Quantum Number, Lowest Energy Level) M L=0 (MAGNETIC QUANTUM NNUMBER) M S=0 Orbital Shape=2S (One Orbital, 2 Electrons) 9.11 *2=18.22 18.22-26.66=8.446

Arcsin 0.8446=1 RADIAN TRY BeCl2=79.9278 Mass=4.4 4.4/79.9=55.05 55.05-100= 0.01816 1-0.01816=9.81 y^2=0.45369 y/(2π)= 0.0722 1/y=13.85 1-1/y=0.86 e^y=1/y=1=(1.618)(0.618) ye^y=1 ye^y/0.618=1.618 1/[x-1]=x This Is The Universal Equation

Cusacks Universal Constant

C.U.C. k=50.07

P=kT=50 * 26.01=13

100-13=0.86

0.86=d=v=a=sin 1= cos 1= $e^{-0.15}$

Golden Mean - The Answer

The Universe exists where,

YX=1 Displacement* Time=1=Energy

and

SIN θ=COS θ==e^{-x}=Acceleration=Displacement=Temperature

y=1/x y'=-1/X^2

y(1.618)=-0.3820=rise /run=dy/dx

∫dy/dx=∫0.3820

y=0.3820x yx=0.3820x^2

yx=0.3820x^2 0.3820x=1/x=0

0.3820x=1/x

x=1.618 golden mean

Mass Ln T=M e^m=T Lm e^M=1.1111=1/9

4.4=X *1/9 X=39.6=T (Hz)=T/sec=dT/dt

39.6=dT/dt=39.6 (0.4 sec)=dT=15.84

100-15.84=0.8416=sin 1 tad

39.6=[1- sin 1 rad]/0.4

1-sin 1 rad=0.1584

1 cycle - 0.15 cycle=0.1585=conjugate of universe

T=39.6 x=39.6 x=26.01

x=0.06568

1/x=conjugate of universe

1/x=[1-0.1618]=1.1618

x-0.618

Temperature P/k=T P=kT F=Ma=kT M=cT/a 4.4=(3/0.858)*T

T=1.25 2T=2.5 T=2.51/2 T=[1/t]/2

T=1 t=0.5 sec

2T=2.51 $T=e^{-x}$ 1.25=ln e^-x -x=0.2231 1/x=4.48=M

Ln T=M

$E=Mc^2$ E/c^2=M=Ln T

T=e^[-E/²]

Cusack's Universal Constant

PV=nRT P/k *V=nR(P/k) Vk=nR

k=nR/V=1/V k=1/V [=]/m^3

For our universe, k=50.07 (10^29)/m^3

PV=nrT Pv=nRT P=nR(P/k)

k=nR=6.022 (8.31) k=50.0 26.666 kN.m^2/(2/t)=$e^{-0.15}$ (T) P=kT $P=T^2$

$=(kT)^2=k^2T^2$

$P=k^2T^2=(1)(P)^2=P=P^2$

$P=1^2(-P)$ $P^2-P=0$ P-1=0 P=1 P/k=T T=1

k=-1=∫W=1/.E dP/dT=sin θ/$e^{0.15∫}$ dP e^0.15=∫ dT sin θ

=1

-PT=T -PE=T [=] /s [=] Hz=1 Hz

E=-P/T Energy=Pressure/Temperature

Temperature=Pressure/Energy Temperature=Ma/Mc^2 Temperature= a/c^2 Temperature= 0.86/ 9=0.0953

Temperature=0.0953 * 273=26.01 K

PV=nRT 26.666 (53080)k=6.022 (8.31) (26.01)

k=9..1958 sqrt k=c c^2=k

P/k=T 26.666/3*3=2.96=c=T

Temperature=Speed of Light

1 Hz= 0.4/0.4 s=1

0.4 x 360°=0.1440

1-0.1440=0.856 0.86

2π * 0.4=2.51 1/2.51=0.4=t sec

Gravity and Energy and Mass

M=E=Mc^2 c=1 E=1 E=c 1.15|*0.858=0.981 cf 9.81

$e^{0.14}$ * sin 1=g

e^[1-sin 1]*sin 1=g /10 e^(1-X)*X=g

X=0.86

Bonds (6 +2) x 8.24 J/bond=65.9 J

$E=Mc^2$ 65.9=M (9) M=7.3244

1/M=0.1365

1-1/M=0.8635

M*0.7344=2π

$M^2=2\pi$

7.3244/ [10 *0.858)=0.853 0.86

$M^2=2\pi$ M=√(2π)=2.506 M=1/t

1/E=t when M=2π/4.4=1.42 c=1, E=1

2π/4.4=1/t

t=0.0637 1/t=15.7 100-15.7=0.843

M=E

1/E=t=0.4

$E=Mc^2$ $E^2=M^2c^2$ E^2=2Pi *9^2 E=22.55 1/E=4.465=M

Here is why G=6.67

2Pi∫x^2-x-1

x^3-1.5x-3x-12*π=0

x=4.233=cuz *10

1.618+0.4233/2=1.83

-0.618-0.4233/2=0.8297

Distance=2.66 cf 26.666=F

So the negative Energy below the x axis=the positive Energy above the x axis.

Y=re^{α}t

0.203=(1) eα (0.4083)

α=Ln Y/t=Ln 0.2028/0.4083=3.90

6.67/√3=G/√ 3=3.85

Eigenvector=1.5

Vector=√ 3

1.5030/√ 3=0.86=E

E,L, t, G,v,a, F,s

Of course i don't yet know, but i don't think there is sand outside the universe. Its just energy acceleration or gravity pulling down on the surface of the ellipsoid.

So newton gave us

26.666=6.67 (M_1M_2) (1)

M_1M_2=4

M_1M_2=2 *2=4=$(dM/dt)^2$

[V I Arnold]

x 0=∫C Epil

Eigenvector Eig=1/G=dE^2/dt^2

x o=∫ [1/d^2E/dt^2]=1/ (2t-1)

2t-1=1.5

t=1/4

x^2-x-1=1.1875

1/1.1875=0.8421 cf 0.8415

the golden mean 1.618 is an eigen value of the energy equation. g is the eigen vector

from wikipedia:

G=1.618 E=8 $G^2 + E^2$=72 √ 72=8.485 cf. 0.8415

Mass Gap

$a^2/2! + A^3/3!$ ....

e^t=1/G=1.5=1+0.4083+ $0.0483^2/2+0.4083^3/6+0.4083^4/24$=1.5030= MASS GAP

e^A=lim n==> ∞[E+A/n]

So, from a bove e^t=1/G

e^t=d/dt $[E'+0]^n$

e^t=E'$]^n$

e^t=dE/dt ^{n}

Ln e^t=nLn dE/dt

t=∞ (Ln (0)

t=∞ *1

t=∞

e^∞=∞

et=1/G

G=0

It is outside the universe

IF E=1

THEN e^t=lim n==> ∞$[1+t/\infty]^\infty$

lim (1)=0

∫e=∫ X^2-X-1

$X^3/3$ $-X^2/2$ -X=-$[1.618^3/3-1.618^2/2$-1..618]+$[0.618^3/23-0.618^2/2$-0.618]=0.9607

E=Mc^2 0.9607= M(c$)^2$ M=0.3.14

Repulsive Energy=3.14=π

Forces up and down in balance

UP:

M ρ * volume below X axis=3*3.14=9.42

E=Mc^2=9.42 (9)=84.78 cf 0.,86

DOWN:

L=1.35 * 2π rotation=84.78 cf 0.86

In balance!the universe is like a ship boyant between attractive and replusive forces. Noah's ark let call it. The critical level was when -e reached π

The universe is in the same way - repulsion and attraction.

The repulsion is 3.14=energy

The attraction is the area O=PπR^2=π(1)=3.14

There must be two opposing forces. note that the attractive is stronger since E MIN=-1.25 .

SO, T.E.=8 1.25/8=0.1565 CF 0.8435

1/ 0.1565=6.39 "Pregnant 3'S"

So the universal energy comes into balance (attraction and repulsion) when E=8, E MIN=1.25,

$X^2+Y^2=R^2=\pi$

$2X^2=\pi$ 3.14159/2=X^2

X=1.2533= E_{min}

The Speed of Light?

dM/dt=t/c

2=0.4083/c c=0.204 cf 0.203=E

c oz=4411764.70588 c oz=1.4705 c=1/0.6800c

So here we have the derivative x=1/2 E=0 the Energy=0, x=1.618 and the integral x=0.5+0.5=1, E=8

The derivative of the blue function (S shaped) is 1.5 This is 1/6.667=1/G

If you look at the green function (parabola) is the shape of the universal ellipsoid end on 1 x 8 x 22

At x=1, and E=8, we have the slope of the integral=1.5.

The shape of our universe is determined by the constant G (or G is determined by the shape!)

The slope of the integral is a vector field. slope m=1/1.5=G

The S shaped function is what the gravity field looks like across and outside the material universe. Note the derivative - the Energy- goes to 1/∞=0.

The Universe in Totality

RECALL e^t=G

M M'* E"=E ρ

e^tG=1

$e^{x*}X*$ y"=y

CLAIRNAUT EQUATION

1/G= M_ρ/E_ρ * dM/dt

1/E"=M_ρ * M' /E_ρ

d2E/dt2=E_ρ/ M M'

E=G= f(E_ρ , M_ρ)

G=1/ e^{kt} * x_0

If x_0=k=1

1/e^t= 1/[f(E_ρ, M_ρ)]

We know from the Cusack Gravity Equation

$1/G=M_\rho/E_\rho *(dM/dt)$

$E_\rho/ E''=M *M'$

$E''= M M'/E_\rho$

$\int E''dm=E'M=\int [M*M'/E_{\rho]} dm$

$EM=M^2 M * 1/ E_\rho$

$E=M^2 *1/E_\rho$

$E=2^2*1/4=1$

E=dE/dt

dE/dt=d2E/dt2=G=6.67

E=G

Ordinary D.E

$t-t_0=1/k\ d\ \varphi/x_0$

$d\ \varphi=x\ o\ e^k(t-t_0)=x_0\ e\ (0.4083)=1.5\ x_0$

$t-t_0\ (1/1)\ (1.5\ x_0/x_0)=1/G=1/6.66$

$e^t=1.5\ e^t=1/G\ Ln\ (e^t)=Ln\ (1/G)\ t=Ln\ t'$

$\varphi(t)=e^k tx_0=e(0.4083)*(1.5)=1.5^2=1/t^2$

$1/t^2=xo=x_0e^{0.4083}$

$1/1.5=1.5(1)\ x_0=1/t^3=x^{-3}$

$\oiint=\int 1/x^2 \int Ln\ x^2=1.1597$ cf. 0.84

E*t*s=8*0.5*0.4083=1.633

1/1.633=0.620

dervivative of E= 2t-1=2(.81)-1=0.620

space * time=0.204=Y= universe 0.202 x 8=1.618=GOLDEN MEAN

1.618/0.618=1=Pr (Universe exists)

E=9/2 h Ω

If we multiply this by 0.9406

31.7Ω (Human perception 31.8 Hz)

31.7 Ω/[2*100]=0.1586

1-0.1585=0.8415

$\sin^1=57.29°=1$ radian

$a=31.7\ \theta/s^2$

$\int a=v=31.7\ \theta=31.7\ (0.1334)=4.2288=cuz*10$

x^2-x-1

lim x==> 0.806= 2x-1

x=0.612

lim x==> 0.81= 0.620

So 0.618 is in between where the energy crest over.

0.618=h Ω

0.618/6.262=.00933 cf. 0.00927

The derivative of the Energy function at x=0.81 is=√(-1) So the slope of the tangent to the universal function is √(-1)

1/81=0.12345679

ΔN=7-6-5-4-3-2-1=0=-16

$9-7=2=G=d^2E/dt^2=dM/dt$

So the equation of the universe crests over at d^2E/dt^2 or dM/dt or G

$x^2-x-1=2=G$

$(2^2-2/G)=3$

G=6.67

ΔN=1/8=0.125

2/8-1/8=1/8=ΔN

ΔN= K.E./[P.E+K.E.]

0.125=ΔN=1/ [mgh+1]

0.125=1/[x+1]

0.125x+0.125 -1=0

x=7

Now 1/0.806=1.2407

1.2407-(-1.25)=2.4907=T Period

1/T=t=0.4015 cf 0.4083

So, there are 8 steps to get to cresting over to 2. 1/0.125 x=2

$x=4=E_\rho$

So when the Energy density=4, the universe comes into existence.

$x^4-x-1=0$ x=-1

δE/ δ t= 1/t=E

E=8=1/0.125

1/1.25=0.8

$0.8^2-0.8-1=1.24 \sim 1.25$

1/t=1.24=0.806~81

1/81=.012345679

y=mx+b

$y_1=\infty/0$ X

$y_2=0x$

$y_1=y_2\ \infty\ /0$ x=0

x=0

$y_1=\infty$

z=0

The physical Universe begins at the origin and continues for infinity.

Cusack's Constant

X=1/(X-1)

X-[1/(X-1)]=0

sqrt [1-1/3.666]=sqrt 0.7272=0.85

[sqrt[X-[1/(X-1)]]]=sqrt 0=0

[sqrt[X-[1/(X-1)]]]-sin 1=0

[sqrt[X-[1/(X-1)]]]=sin 1

X - 1/X-1=0.72

X - 1/(X-1)-0.727=0

X=1.873=CUSACK'S CONSTANT

X/c=1.873/2.985

$\sin^3 \theta$=1.873/2.985=(0.8471^3)

θ=1 rad

$c=1.873/\sin^3\theta$

Cusack's Constant=1.873

Ln (1.873)=SIN ^{3} 1 RAD

Ln (1.873)= ∫[SIN * COS * e^{-x}]=NmK

1/Cusack Constant=0.534 (APRIL 3, 2005)

y=sin θ+cos θ

y'=-cos θ+sin θ+C

max /min y'=0

y'=0=sin θ-cos θ

sin θ= cos θ

θ= 1 rad

cos θ= d sin θ=F=Ma d=F=Ma d=Ma d=a M=1=E (minimum energy)

$E=Mc^2$ $1=d/a*c^2$ $c^2=1$

c=1

Golden Mean

To sum up, if we take the three functions representing force, displacement, and temperature, we have the following:

$y=e^{0.14}$ +C3

y=sin 1 +C2

y=cos 1 +C1

C1=C2=C3=1=Energy

Take the derivative of one function:

y=cosθ +1

y'=-sin 1+1=-0.858+1=0.142

y'=y=e^0.14+E=0.14=1.14+E E=1 when y=y'

AREA UNDER CURVE:

∫SIN 1+∫ COS 1+ ∫$e^{0.14}$

=-cos 1+sin 1 +Ln 1.14=-0.86 +0.86+0.1327=0.1327=1- cos 1=E-a=E-v=E-d=E-T

a=v=d=T acceleration=velocity=displacement=temperature

The temperature of space is -236° C cf -270 °

This is the condition under which the universe exists.

Conclusion

Astro-Theology, Cusack's Universe provides a new was of looking at our stable universe.

References

1. Arnold VI (1978) Ordinary Differential Equations MIT Press, USA 1: 1-290.