First Principles:
THE FLOW AND INTERACTION OF ENERGY AND TIME

Flow and Interaction[1a, 1b]

"You have achieved what Leonardo aspired to."
– Curtis Wong, Curator, Bill Gates' Codex Leicester

The Mathematics: Chaos and Complexity[2]
(Shown here: the Lorenz attractor)

FLOW		INTERACTION	
dx/dt	=	6 (y-x)	*convection*
dy/dt	=	x(p-z)-y	*temp (horizontal)*
dz/dt	=	(xy-βz)	*temp (vertical)*

"Flow and Interaction applies to everything. Everything in the Universe."
– Dr. Murray Cantor, IBM Fellow, UC Berkeley Professor,
at the FiRe 2017 Conference[3]

ENERGY[4]		TIME[4]
What is flowing? Energy.[5]		Time is the interval we apply to measure it.[6]
$E=MC^2$ OR $2(MV^2/2) = M(X^2/T^2)$[7]		T

THE PRINCIPLE OF LEAST (EFFECTIVE) ACTION[8] (mechanics):

$S = M\int Vdr$; MVR **or** $= M(X^2/T^2)$	*	T (including special relativity)

HEISENBERG UNCERTAINTY PRINCIPLE[9] (quantum mechanics):

ΔE	*	ΔT	≥	$\hbar/2$	(accenting time view)
ΔP	*	ΔX	≥	$\hbar/2$	(accenting space view)

2ND LAW of THERMODYNAMICS[10], TIME'S ARROW,
GIBBS FREE ENERGY EQUATION

ΔG	=	ΔH - TΔS

LORENZ ATTRACTOR (repeated as E and T[11])

dx	=	dt [6 (y-x)]	*convection*
dy	=	dt [x(p-z)-y]	*temp (horizontal)*
dz	=	dt (xy-βz)	*temp (vertical)*

