The first ten million millennia or so

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In the "beginning", nothing
No time, no space, no matter.
No energy, no strings
nothing
not even a point, not even a void
nothing.

No laws of physics,
No myths, no gods;
Nothing, absolutely nothing
Nada **0**

Then, a singularity.
Call it a bang, call it a **Big Bang**, call it light, call it God.
Perhaps a thought.
In the beginning,
the Laws of Logic begat the Laws of Physics.
The rules.
From Nothing, **expansion,**
False vacuums, phase changes, beginning of time, and space.
Potential for something. Everything.
Energy, potential.
Waves, strings;
Vibrating strings
Monopoles, sheets, threads
Webs.

From the void, chaos
Out of vacuum, Genesis.
Condensation, knots,
Cosmic freezing,
Wrinkles in time, defects, domains,
Bubbles, foams. A detergent universe.
Strong force, weak force,
Symmetry breaking; **machos**, *wimps,*

Tubes of energy, gigantic loops.
A pasta universe.

Plasma mist, quarks, gluons, muons,
Nuclei, electrons
Protons
Collisions, bouncing
Binding
Deuteronomy.

Add neutrons-
Tritium;
Plus proton, Transmutation!
Helium 3, *Alchemy.*
Tritium swallows proton
Helium 4!
3 billion degrees or more.
A helium universe
Three minutes gone.
Aeons more to go
Before the Rest.

A Quantum world. The Dreams that Stuff are made of.
4 minutes into it
mostly light, protons swarm; electrons,
positrons annihilate
positrons gone.
A proton-electron world
Ghostly neutrinos and their antis.

Lots of light, but no where to go; opaque.
Universe rests at helium,
But time goes on,
Cooling, the first millennium,
Space expanding,

Great attractors,
Gravity.
Still Opaque
300 000 years
3000 degrees
electrons and protons
hydrogen and photons
atoms

protons and electrons unite
mate.
Create, annihilate
Create, annihilate
Cooling universe, changing color.

In the beginning,
lurid gamma, off the spectral scale;
Shades to x-ray
Fades to UV, then violet and blue
3000 degrees, yellow.

Visible matter, not the half of it,
Dark matter, the cosmic glue...
Dark invisible matter, holds the cosmos together
Not baryonic
But what?
Gravitino, photino, axion faith?
Invisible dark matter
Closes the universe
Gas and dust and that. Clumps.

Then, the stellar delivery room
The crucibles of elements, the "metals".
Mostly nothing, a few dense spots,
Patches made of "less nothing"
In a spider web of strings,
Galaxies
Clusters of galaxies,
150 million years into it.

Translucency;
Light moves off.
Dense clumps
Nebular womb
Globules
Embryos
Star birth ! Here and there.
Condensing, collapsing, heating.

Hydrogen, helium fuse
150 million years into it
Matter everywhere, Energy(Kinetic)
Flat whirling disks
BLACK HOLES
THE WHOLE SHEBANG

QUASARS
ELLIPTICALS
SPIRALS

SPACE, FLAT AND ISOTROPIC AND CLUMPY,
BURNING STARS,
THE PHILOSOPHERS' STONES
HYDROGEN COAL TO HELIUM GAS
HELIUM COAL
CARBON COAL
COAL COAL
REAL COAL FOR MIDDLE-AGED STARS.

SILICON CORES
FINALLY, IRON
THE END OF THE ROAD

SUPERSTARS
COLLAPSE, REBOUND
SUPERNOVA!

ALL THE ROWS AND COLUMNS OF MENDELEEV'S TABLE
PERIODIC.
STABLE, UNSTABLE.
SCATTERED TO SPACE.

The stuff of fable
Two millennia ago, at 3 BC
A beacon in the east.

Cobalt, nickel, xenon
Strontium, platinium, uranium and the rest
Blasted to space
Stuff of Stars.
Building blocks of us

Movie stars and railway cars
Blown to a distant eddy
A new congealing gas-dust cloud,
On the edge of a spiral,
Gravity attracts
Rotation shapes
Knots and eddies
A central star seed
Ignites, lights
Driving off its dust.

A disk
A gassy ring

Condensing, cooling
Ice at the edges
In bulbous middle
Gas balls grow,

The Giant Gods of Legend
Jovial, Neptunian, Saturnalia.
Uranian.

Fe and Ni to dense cores of embryo planets, proto Earth
Then rocks, oxygen, silicon, aluminium,
A growing world,
Dante's Inferno, layer by layer.

Earth emerges, Gaea
Bright it gleams, molten,
Heated by energy within and without
Uranus and Thor's Daughters,
Alpha and Beta,
And stoned by Jove and Oort,
Pebbles from space.

A hot birth
Volatiles boiled off, gone
Blown away by sunlight
Rarely, giant impacts
Towering walls of ejected lava,
Liquid craters
Magma oceans
Dante's nightmare
Violent rebirths, Begin again.

Time...
Cooling, congealing
...heals all
rafts of rock, floating under
a moonless sky.
A cinder, healing,
A cooling lump.
A lonely sky.

Another world, passing by
Perturbed, no doubt, closes in
Smashes, crashes,
Splashes molten mantle to orbit.
A moon made out of Earth

Drying out our planet,
Already bone dry.

All gases, long gone; never there.
No water, methane, CO2,
Ammonia, hydrogen; no air.

No noble gases
Others either.
Dry Dearth, nothing to breathe,
In a hydrogen Universe.

Cooling again
Freezing again
A crystalline sphere
A merger of planets and their Luna child
A Newtonian accident
From chaos to Gaea
Mother Earth.

Pelted from above by cosmic debris;
A Jovial sneeze
Rocks, stones, dirty iceballs
Asteroids and meteoroids
Comets

The final 1%
Carbon, water
Stirred in from the top
Sulfur, phosphorous
Potential life.

Silicon, iron, aluminium,
Oxygen, nickel, calcium
A boring planet make
A lifeless crystal
A hard hard world
An elastic brittle world.

Add a dash of water
Watch the action begin
A flowing, viscous world
A volcanic world
A round opaque lava lamp
Renewing itself
Endlessly

Steam, the water
A gentle rain from far-off heavens
Holy water
Without it...
No geology, no theology
No arcs, islands nor Noah
No regurgitation
No renewal
No Life.

A static dry Venereal planet
No ridges, no plates
No oceans, in or out
Nor myths
Nor gods
Nor prayers or devotions.

The final 1%
A pinch
An afterthought
Brings in hydrogen and helium
Argon and krypton
Xenon and carbon
A final veneer.
And earth becomes Earth.

So, we finally arrive
At Four Point Five.
Earth and the brethren.

Look at Mercury,
Quick, silvery,
Dense, dry
Tide to Sol

Look at Mars
Rust
Moons
THIN AIR

Look at Moon
Dust
Dunes
Can't live there

Look at Venus
Swirling motions,
Cloudy and fair
Much too
Hot

Look at Earth
Crust
Oceans
Air
Life
Cool!
A trivial speck, an afterthought
But all we got.

So here we are,
Simple and meek,
Now how do we get through the rest of the week?