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CRYPTOPLANET UPDATE

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CRYPTOPLANET UPDATE

CONSERVATION OF ANGULAR MOMENTUM

CONVECTION

UNIFORMITARIANISM

FORMATION OF PLANETS

FORMATION OF CRYPTOPLANETS

CRYPTOPLANET CHARACTERISTICS

HOWEVER, THIS CAPTION DOES NOT EXPLAIN THE FIGURE

MASSES:

SKATER 50 KG, HAIR 50G, SKIRT 500G

1/1000 OF MASS MOVES OUTWARD IN HAIR

1/100 OF MASS MOVES OUTWARD IN SKIRT

ADD 1 KG LEAD DRAPERY WEIGHTS TO HEM OF SKIRT. NOW 3/100 OF MASS.

ENOUGH TO REDUCE SPINUP

CONVECTION

UNIFORMITARIANISM IN GEOLOGY

100 YEARS AGO GEOLOGISTS WERE UNIFORMITARIANS. THERE WERE SLOW UPLIFTS, SLOW EROSION, SLOW LAYERING, AND THEN THE DEPOSITS WERE UPLIFTED AND THE CYCLE WAS REPEATED

ALL IMPORTANT CONSTRUCTION TOOK A LONG TIME AT MM/YEAR

IN 1915 WEGENER PROPOSED CONTINENTAL DRIFT THAT REQUIRED MOTIONS OF CM/YEAR AND UNKNOWN PHYSICS

THE UNIFORMITARIANS RIDICULED THE THEORY, SUPPRESSED RESEARCH ON IT, AND PREVENTED PROGRESS FOR MORE THAN A GENERATION

THE UNIFORMITARIANS ALSO SUPPRESSED CATASTROPHIC EXPLANATIONS FOR EVENTS, EVEN VIOLATING COMMON SENSE AND EVERYDAY EXPERIENCE

UNIFORMITARIANISM AND CONTINENTAL DRIFT WERE CONSISTANT AT ONE TIME WHEN ALL THE CONTINENTS MERGED INTO ONE, PANGEA, AND THERE WAS ONE OCEAN. THE MOUNTAINS WORE DOWN. THERE WAS NOT MUCH WEATHER AND NOT MUCH WEATHERING. EVERYTHING SLOWED DOWN.

FORTUNATELY, THE CORE IS RADIOACTIVELY HEATED AND CONVECTION EVENTUALLY BROKE UP PANGEA OR WE WOULD NOT BE HERE TODAY

UNIFORMITARIANISM IN BIOLOGY

BIOLOGISTS USED TO THINK THAT

UNIFORMITARIANISM IN ASTRONOMY

CONVECTION IS UNIFORMITARIANISM AT WORK. IT JUST GOES ON AND ON FOR BILLIONS OF YEARS FROM PROTOSTAR TO THE MAIN SEQUENCE AND UPWARD. BORING.

UNLESS THE MAGNETIC FIELD IN THE INTERIOR OF THE STAR HAS A SECRET LIFE, AT INTERVALS LONGER THAN PEOPLE HAVE BEEN OBSERVING.

FORMATION OF PLANETS

THERE ARE SIMPLE, LOGICAL RULES THAT ARE THE SAME FOR EVERY UNARY LATE-TYPE POP I PROTOSTAR IN THE UNIVERSE

PLANETS ARE SELF-GRAVITATING BODIES > 10^26 G FORMED FROM PROTOSTELLAR DISKS AFTER PROTOSTARS FORM

ALL UNARY DWARF LATE-TYPE STARS ARE FORMED FROM DISKS AND HAVE PLANETARY SYSTEMS LIKE OURS UNLESS AN OB STAR, OR A SUPERNOVA, OR A COLLISION HAS DISRUPTED THE DISK

BINARIES PROBABLY HAVE PLANETS AS WELL BUT I DO NOT DISCUSS THAT HERE.

WASTE MANAGEMENT

EVERY UNARY POP I PROTOSTAR HAS THE SAME WASTE MANAGEMENT PROBLEM

DISK WASTE PROPERTIES:

RADIOACTIVE, SELF-HEATING

MAGNETIC, FE ~ SI

CARBONACEOUS

DAMAGE BY RADIOACTIVITY, RADIATION, AND PARTICLES

FREE RADICALS, BROKEN MOLECULES, POSITIVE AND NEGATIVE CHARGES

CARCINOGENIC

GENERALLY STICKY

FAR FROM STAR, ICY

DISPOSAL METHOD: DISPERSAL

NEARBY OB STARS, OR SUPERNOVAS, OR COLLISIONS BLOW EVERYTHING AWAY.

IT IS FREE ENERGY.

THE PROTOSTAR ROTATES ONCE PER DAY

DIFFERENTIAL ROTATION AS IN THE SUN

PROTOSTAR IS SLIGHTLY OBLATE

WHAT HAPPENS TO THE DIPOLE MAGNETIC FIELD?

WHEN THE DIPOLE FIELD PULLS OUT OF THE DISK TO FORM THE SUPER-CME, IT FILLS THE SURFACE OF THE STAR FROM ABOUT +70 TO -70 DEG LAT

SUPER-CME ILLUMINATES BOTH SIDES OF THE DISK AS WELL AS THE INNER WALL

RADIATION AND PARTICLES BLOW AWAY ALL THE INFALLING GAS OUT TO ~ SNOW LINE AND PUSH INWARD ON BOTH SURFACES OF THE DISK SO THAT DUST AGGLOMERATES. VAPORIZES AT SURFACE

OPTICAL DEPTH OF POPCORN IS MUCH LESS THAN THAT OF DUST FROM WHICH IT IS MADE

PLANETS FORM SEQUENTIALLY OUTWARD

RADIATION AND WIND FROM STAR HEAT
POPCORN AND PUSH IT OUTWARD

ORBITS MOVING OUTWARD CROSS STATIONARY
ORBITS AND ORBITS MOVING INWARD AT
AT SHALLOW ANGLE SO SLOW COLLISIONS

WALL OF AGGLOMERATED POPCORN
(= POPCORN BALLS) FORMS THAT ABSORBS
3-5% OF THE RADIATION FROM THE STAR

NEAR STAR VOLATILES ARE COOKED OUT

POPCORN AGGLOMERATES AND CONSOLIDATES UNTIL PLANETESIMALS FORM AND THE WALL BECOMES OPTICALLY THIN

A NEW WALL FORMS FURTHER OUT WHERE THE DISK IS INTACT AND THE PROCESS REPEATS

AS THE RADIUS INCREASES THERE IS LESS "COOKING" OF THE POPCORN

PLANETESIMALS FORMED IN THE WALL ARE IN NEARBY ORBITS

THE DISPERSION OF THE DOTS IN THE CARTOONS IS GREATLY EXAGGERATED

THEY RAPIDLY GRAVITATIONALLY COLLAPSE INTO A PLANET

NOT ENOUGH MASS IN ASTEROID WALL TO FORM A PLANET. LEFT WITH PLANETESIMALS

SNOW BELT

ICE IS ADDED TO THE POPCORN AND DUST IN JUPITER'S WALL. A LARGE CORE FORMS THAT IS ABLE TO PULL IN GAS

UNIFORMITARIANISM WORKS FOR THE OUTER PLANETS

SINCE RADIATION FROM THE STAR IS SO WEAK AT THOSE DISTANCES, THEY ARE ACCRETED SLOWLY BY UNASSISTED GRAVITY

REMINDER: CFA Colloquium 4 May 2006

SPEAKER: David Wilner (CfA)

TITLE: 6o22.0 Disks: 1 Tf (42)Tj ETBT 13 0 025.00037639.9

SPEAKER: Renu Malhotra (University of Arizona)

TITLE: Bombardment History of the Terrestrial Planets

ABSTRACT: [edited]

Analysis of the impact crater record of the terrestrial planets and the Moon implicates two populations of impactors that are distinguishable by their size distributions.

The old population, responsible for an intense period of bombardment that ended 3.8 Gy ago, is virtually identical in size distribution to the present main belt asteroids;

the second population, responsible for craters younger than ~3.8 Gy, matches closely the size distribution of the near earth asteroids.

An inner Solar System impact cataclysm occurred ~3.9 Gy ago,

Many asteroids were ejected from the main belt on a short

DATE: MONDAY, November 20
TIME: 11:30
ROOM: Pratt

PONT'S TRANSITING PLANET TABLE

NAME	Mplanet	Rplanet	Period	a [AU]	
OGLE-TR-10	0.61	1.22	3.101278	0.04162	
OGLE-TR-56	1.29	1.30	1.211909	0.0225	
OGLE-TR-1O21.75761		1922	3.101278	0.04162	OGLE-T

PONT SAID, IN JEST, THAT EXOPLANETS SEEM TO BE DIFFERENT FROM OUR PLANETS AND THAT OUR PLANETS WOULD TURN OUT TO BE WEIRD

THAT IS WHY I DECIDED TO GIVE THIS TALK

"I think we’re missing something fundamental about the interior structure or atmospheres of hot Jupiters."

--- Josh Winn

EXOPLANETS

THE ONLY CONNECTION BETWEEN PLANETS AND EXOPLANETS IS THAT THEY BOTH ORBIT STARS

IN GENERAL:

EXOPLANETS ORBIT CLOSE TO THE STAR
EXOPLANETS HAVE MORE ECCENTRIC ORBITS
EXOPLANETS ARE MORE MASSIVE
EXOPLANETS ARE LESS DENSE

NOT A SINGLE EXOPLANET CAN BE MATCHED TO A PLANET

ANYONE WITH COMMON SENSE WOULD THINK THAT THEY ARE TWO SEPARATE CLASSES OF OBJECT

A NEW CLASS OF OBJECT REQUIRES AN EXPANATION AND IMAGINATION

I DID NOT BELIEVE THAT THE FIRST EXTRA SOLAR GIANT PLANET WAS A PLANET. NEITHER DID DAVID BLACK.

I MADE UP A NAME FOR THE CLASS: CRYPTOPLANETS

WHEN OBSERVATIONS IMPROVE THERE WILL EVENTUALLY BE EXOPLANETS THAT ARE PLANETS, SO EXOPLANET IS NOT A VALID NAME FOR THE CLASS

CRYPTOPLANETS

WHAT ARE THEY?

PLANETS ARE WASTE DUMPS FROM THE DISK

MAYBE THEY ARE WASTE DUMPS, BUT NOT FROM THE DISK

- WASTE INFALL?
- WASTE ANGULAR MOMENTUM?
- WASTE MAGNETIC FIELD?

SINCE CRYPTOPLANETS ARE CLOSE TO THE STAR, THEY ARE PROBABLY ALL THREE AND FORM BEFORE PLANETS

START WITH THE SAME PROTOSTAR MACHINERY AS BEFORE

STANDARD SCENARIO ASSUMES ISOLATED EVOLUTION BUT STARS ARE FORMED IN CLUSTERS

IF THERE IS A COLLISION WITH A DENSE CLOUD, OR WITH A STAR, OR IF AN OB STAR FORMS NEARBY, OR THERE IS A SUPERNOVA, THERE CAN BE A PULSE OF ENHANCED DENSITY

LET THE COMPLEX MACHINERY NOT WORK PERFECTLY SO THAT THERE IS EXCESS INFALL THAT THE DIPOLE MAGNETIC FIELD CANNOT CONTROL

THE PROTOSTAR, THE MAGNETIC FIELD, AND THE DISK CONTINUE TO EVOLVE AS BEFORE FOR PLANET FORMATION

THE COUPLING BETWEEN THE STAR AND DISK WEAKENS AND THE FIELD LINES WRAP

RING IS HOT AND DENSE AND HAS A LARGE SURFACE AREA

RING AND SUPER-CME ARE VERY LUMINOUS.

SUPER-CME PRODUCES STRONG PARTICLE OUTBURSTS

RADIATION AND PARTICLES BLOW AWAY ALL INFALLING GAS OUT TO ~ SNOW LINE AND PUSH INWARD ON BOTH SURFACES OF THE DISK SO THAT DUST AGGLOMERATES. VAPORIZES AT SURFACE

SINCE RING IS EQUITORIAL, IT MAY DESTROY MORE OF THE INNER DISK AND REDUCE INNER PLANET FORMATION

RING IS UNSTABLE AND RECONNECTS IN SECTIONS

HOT DENSE PLASMA BLOBS ARE ENCAPSULATED IN SPHERICAL MAGNETIC BOTTLES, SPHEROMAKS.

BLOBS ARE LARGE ENOUGH AND DENSE ENOUGH TO BE GRAVITATIONALLY BOUND WHEN THEY COOL, CRYPTOPLANETS

MAGNETIC BOTTLES SHIELD THE CRYPTOPLANETS FROM ABLATION BY THE STELLAR WIND

THE NUMBER OF CRYPTOPLANETS IS RANDOM, UP TO A DOZEN

SOME OF THE CRYPTOPLANETS ARE
EJECTED FROM THE SYSTEM,
OR FALL INTO THE STAR,
OR EVAPORATE,
OR MERGE,
OR CONTINUE TO ORBIT.

CRYPTOPLANETS CAN ACCRETE NEUTRAL GAS

MASS CAN VARY UP TO BROWN DWARF MASS

BROWN DWARFS CAN BE CRYPTOPLANETS,
FREE OR BOUND

CRYPTOPLANET CHARACTERISTICS

SPHEROMAKS EVENTUALLY COOL AND BECOME CRYPTOPLANETS

COOL FOR A CRYPTOPLANET IS STILL > 1000K.

FORM TYPICAL PLANETARY MOLECULES BUT WITH NON-PLANETARY ABUNDANCES

OPACITY IS NOT PLANETARY

INTERIOR MODELS ARE WRONG

CORE NOT AGGLOMERATED BUT LOW DENSITY

SURFACE MODELS ARE WRONG

PREDICTED ENERGY DISTRIBUTION IS WRONG

CANNOT ASSUME SED IN INTERPRETING SPITZER OBSERVATIONS

CRYPTOPLANETS ARE A GENERAL PHENOMENON OF POP I UNARY LATE-TYPE STAR FORMATION

THEY INDICATE THAT SOMETHING WENT

CRYPTOPLANETS MAKE IT DIFFICULT TO DETECT PLANETS

- **MODULATE RADIAL VELOCITIES**
- **BRIGHTER THAN PLANETS**

IN ECCENTRIC ORBITS THAY MAY SWALLOW INNER PLANETS

IF THE PURPOSE OF SEARCHING FOR PLANETS IS SEARCHING FOR LIFE, CRYPTOPLANETS ARE NOT GOOD CANDIDATES

WHEN THERE IS TOO MUCH INFALL, THE INFALL FLOWS OUTWARD AT THE EQUATOR AND HITS THE INNER WALL OF THE DISK.

THERE IS AN IMMEDIATE CATASTROPHE AND PROBABLY MATTER IS FLUNG OUTWARD.