Norbert Winter

The 6 key processes in the creation and development of the Universe – retrospective summary.

When analysing the causal links of all of the seamlessly interconnected individual processes in the history of the creation and development of the Universe described in Chapters I.-XIII. globally, we can recognise a strict causal sequence of the following 6 key processes:

- $(KP1)$: Before the creation of the Universe (preformation structure $\left(\Psi_{\xi U}^{\scriptsize{19}}\right) \equiv$ Universe Code $\left(\Psi\text{-}19\right)$)
- $(KP2)$: The creation of the Universe (the Primordial Universe before the Big Bang $\text{-}_5\overline{G},\ _3G,\ _2R;\ v_1,v_2,v_3\text{-}$)
- $(KP3)$: The rupture process of the Primordial Universe (the rupture of $\ _5\overline{G} \equiv$ the beginning of the Big Bang)
- $(KP4)$: The Big Bang production cascade (in full detail: XI.23.)
- $(KP5)$: The Universe directly after the Big Bang ($\frac{2}{3}$ Dark Matter, $\frac{1}{3}$ Normal Matter/Antimatter)
- $(KP6)$: The construction of Dark Energy with the coupled construction of expanding 4-dimensional space-time

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Preface:

This publication, "The 6 Key Processes in the Creation and Development of the Universe" (abbreviated to "KPU"), is identical to the newly added Chapter (XIV) of "The Unified Construction Process of the Universe and the Development Process of the Universe from the Big Bang until Today" (abbreviated to "EAU" in citations), which was also published on 17/03/2017. The publications "The Act of Creation of the Universe", "The Development Process of the Universe", and "The Universe Code (Ψ-19)" are abbreviated to UEA, UEP, and UC respectively in citations.

Chapters (I.) to (X.) of EAU show in detail how the Big Bang process led to the construction of the elementary particle set of "Normal Matter" (the proton (p^+), the electron (e^-), the neutrino (v), and the force bosons of the strong interaction (St), the weak interaction (Z), the electromagnetic interaction (γ), and gravitation (G)). This was namely triggered by the systemically necessary rupture of the unstable force particle ($_5\overline{G}$) created before the Big Bang, i.e. the first particle ever created. It is shown that the force particle ($_5\overline{G}$) created before the Big Bang was an unstable, most extremely strongly repulsive force boson with an extremely short range, and that these two properties of "most extremely strongly repulsive" and "extremely short-range" meant that the rupture of ($_5\overline{G}$) was "pre-programmed".

This preordained and inevitable rupture ($\equiv$ start of the big Bang) created the first elementary particle set (p^+), (e^-), (v), (St), (Z), (γ), (G.)

UEA (and EAU, (XI.)) shows how this rupture of ($_5\overline{G}$) ($\equiv$ 1st Big Bang event) set in motion the entirety of the most colossal Big Bang production cascade – the phenomenon that has been historically documented as the Big Bang 13.8 billion years ago – and how this led to the creation of the entirety of the Earliest Universe (early stages of the universe, i.e. directly after the Big Bang 13.8 billion years ago) and its components "Dark Matter" ($\equiv$ 66.6%) and "Normal Matter/Antimatter ($\equiv$ 33.3%).

UEA also derives the inner-structural particle composition of these matter/force particles (including "Dark Matter" force particles), and thus derives their matter and force properties, allowing them to be exhaustively grouped into a single list of elementary particles of the Earliest Universe (see also EAU, (XI.36.)).

Building upon these foundations, UEP (and EAU, Chapter XII.) describes the change processes that have taken place within the Universe from the Big Bang until Today. These processes continue to unfold to this day. It is shown why the annihilation processes of both Normal Matter/Antimatter and Dark Matter occurred and continue to occur, and how this in turn led to the creation processes of Dark Energy and the coupled construction of expanding 4-dimensional space-time elementary structure cells (i.e. the expanding structure of space-time).

Thus, UEP shows that 4-dimensional space-time did not exist a priori, but was only created after the Big Bang as a "by-product" of the (pairwise) annihilation processes of the massive matter particles newly created in the Big Bang, and that it continues to be constructed by "ongoing" such annihilation processes to this day.

UEP also describes how each of these matter annihilation processes unfolds inner-structurally, as well as the inner-structural composition of Dark Energy bosons, and how (or why) this leads to the construction of expanding 4-dimensional space-time elementary cells – coupled to the Dark Energy bosons.

Thus, UEP gives a detailed description of the inner-structural relationship between mass, space-time, and energy, and describes how the composition of the universe quantitatively evolved over time from the Big Bang until Today, i.e. the structural progression of the universe via matter-mass annihilation and conversely the generation of Dark Energy and space-time.

The publication "The Universe Code $\boxed{\Psi\text{-19}}$" (and EAU, Chapter XIII., abbreviated to "UC") demonstrates that and explains why the entire matter and force structure of the universe, i.e. every component of the universe, namely:

- Dark Matter
- Normal Matter/Antimatter
- Dark Energy with the coupled construction of expanding 4-dimensional space-time

formed from the same identical preformation structure $\left(\Psi_{\xi U}^{\text{⑲}}\right)$, **<u>and so every part of the universe has the same identical origin</u>**.

UC also shows – as presented in detail in EAU, Chap. I.-V. – that this preformation structure $\Psi^{19}_{\xi U}$ formed from the fundamental dynamic I.1., I.2., I.3. by means of a necessary and unequivocal process.

Thus: The preformation structure $\Psi^{19}_{\xi U}$ **≡** $V.7.$ **underlying everything is the unified inner-structural composition and order system from which the universe developed, from the smallest scales (elementary particles) to the largest scales (global structures of the universe), i.e. from which every component of the universe developed, namely:**

- **Dark Matter**
- **Normal Matter/Antimatter**
- **Dark Energy with the coupled construction of expanding 4-dimensional space-time**

This means that, simplifying the notation by writing $\Psi\text{-19}$ **instead of** $\Psi^{19}_{\xi U}$ **:**

$$\boxed{\Psi^{19}_{\xi U} \equiv \Psi\text{-19} \equiv V.7.}$$ **is the unified inner-structural composition and order system of the universe**

$$\equiv \boxed{\underline{\textbf{Universe Code}} \quad \Psi\text{-19}}$$

Furthermore, in this publication, KPU (as well as EAU, XIV.), an overall retrospective analysis describes how the causal succession of all seamlessly interlocking processes in the creation and development of the universe presented in EAU, Chap. I. - XIII. may be represented as a **causal sequence of 6 consecutive key processes** (for details, see KPU, or EAU, Chap. XIV., KP1 → KP6).

Overview of results:

This publication KPU shows and explains in detail:

That the entire creation and development process of the universe unfolds in the form of 6 key processes (KP):

KP1 : Before the creation of the Universe (preformation structure $\Psi_{\xi U}^{(19)}$ ≡ Universe Code $\Psi\text{-}19$)

KP2 : The creation of the Universe (the Primordial Universe before the Big Bang - $_5\overline{G}$, $_3G$, $_2R$; v_1, v_2, v_3 -)

KP3 : The rupture process of the Primordial Universe (the rupture of $_5\overline{G}$ ≡ the beginning of the Big Bang)

KP4 : The Big Bang production cascade (in full detail: XI.23.)

KP5 : The Universe directly after the Big Bang ($\frac{2}{3}$ Dark Matter, $\frac{1}{3}$ Normal Matter/Antimatter)

KP6 : The construction of Dark Energy with the coupled construction of expanding 4-dimensional space-time

Preliminary remarks:

This publication, "The 6 Key Processes in the Creation and Development of the Universe" (abbreviated as "KPU"), is identical to Chapter XIV. of the publication "The Unified Development Process of the Universe from the Big Bang until Today" (abbreviated to "EAU"), which was newly added on the same date (17/03/2017) of publication. EAU was originally published on 22/05/2015, and has now been extended with the additional Chapters XIII. and XIV.

Accordingly, all section references have been defined to be consistent with EAU, and can be used interchangeably.

Let us now proceed to the detailed presentation of KPU, with all references and details:

XIV.1.

KP1 Before the creation of the Universe

The formation of the inner-structural composition and order system of the Universe $\left(\Psi_{\xi U}^{\textcircled{19}}\right) \equiv$

Preformation structure of the Universe $\left(\Psi_{\xi U}^{\textcircled{19}}\right) \equiv \left(V._7\right) \equiv$ Universe Code $\left(\Psi\text{-}19\right)$

KP2 Then: The creation of the primordial manifestation of the Universe $\equiv$

The Primordial Universe before the Big Bang $(_5\overline{G},\ _3G,\ _2R;\ v_1,\ v_2,\ v_3)$; with a size of around 10^{-14} cm

KP3 The rupture process of the force boson $_5\overline{G}$ in the Primordial Universe $\equiv$ fundamental process of the Big Bang $\equiv$ beginning of the Big Bang. Thus: The rupture process of $_5\overline{G}$ sets the Big Bang in motion

KP4 The Big Bang production cascade

KP5 The result of the Big Bang production cascade is the formation of the Universe directly after the Big Bang ($\frac{2}{3}$ Dark Matter, $\frac{1}{3}$ Normal Matter/Antimatter)

KP6 The construction of Dark Energy with the coupled construction of expanding 4-dimensional space-time created by the pair annihilation processes of Dark Matter $(_4\overline{G},\ _4G\ )$ and the pair annihilation process of Normal Matter/Antimatter ($p^+\,p^-,\ e^+\,e^-$)

The formation of the inner-structural composition and order system of the Universe $\left(\Psi_{\xi U}^{⑲}\right)$ ≡ **preformation structure of the Universe** $\left(\Psi_{\xi U}^{⑲}\right)$ ≡ (V.7.) ≡ **Universe Code** (Ψ - 19)

The Universe is thought to be around 13.8 billion years old. This raises the question: What was there before then, and how did the Universe begin to exist in the first place? What are the inner composition and order structures from which the Universe could have or must have been created, leading to what we know as reality?

Before the creation of the Universe, there must therefore have been some inner-structural composition and order process that develops into a Universe Code that governs all subsequent events in the Universe:

before the Big Bang – Big Bang – after the Big Bang until today, including all global and fine structures and all manifestations of matter and forces.

This construction process of the Universe Code ≡ Universe Code (Ψ - 19) ≡ preformation structure $\left(\Psi_{\xi U}^{⑲}\right)$ is namely:

(KP1)

The formation of the most elementary structure ≡

see I.1., I.2., I.3.

$$D\,\Psi(x) = \Psi(x\text{-}\sigma_1)\,\overline{\Psi}(x)\,\Psi(x+\sigma_1)\,;\,\sigma_1 \to 0$$
$$D\,\overline{\Psi}(x) = \overline{\Psi}(x\text{-}\sigma_2)\,\Psi(x)\,\overline{\Psi}(x+\sigma_2)\,;\,\sigma_2 \to 0$$

with repulsion ≡ $\overset{-\sigma}{\leftarrow}\,\bullet\,\overset{+\sigma}{\rightarrow}$
attraction ≡ $\rightarrow\,\bullet\,\leftarrow$

The formation of the construction process ≡

see I.12.

$$D_{\sigma_{5\text{-}13}}^{5\text{-}13}\left(D_{\sigma_{1\text{-}4}}^{1\text{-}4}\,\Psi(x)\right) \equiv \Psi^{㉗}(x, \sigma_{13})$$

The formation of the structuring process ≡

see IV.5.

structuring binding energy-momentum

$\Psi^{⑧}$ ≡

structuring separation energy-momentum

„∪" separation
„ξ" binding

The formation of the preformation struture $\Psi^{⑲}$ **by incorporating the structuring foundation** $\Psi^{⑧}$ **into** $\Psi^{㉗}$:

see V.7.

Thus: First, the <u>construction process</u>:

point split ⟵ (x) ⟶ point split

$\Psi(x)$ ≡ **basis spinor** ⟶ $\Psi^{①}$

I.12.

$\downarrow D_1$

1 individual differential operation $D_{(1)}$ $\boxed{\Psi\,\overline{\Psi}\,\Psi}$ ≡ $\boxed{\Psi^{③}(x, \xi)}$ ≡ **basis stage** ⟶ $\Psi^{③}$

I.12.

$D_2 \qquad D_4 \qquad D_3$

≡ $\boxed{\Psi^{⑨}(x, \xi, \varrho, \lambda, \eta\,)}$

3 individual differential operations $D_{(2-4)}$ $\boxed{\Psi\,\overline{\Psi}\,\Psi}$ $\boxed{\overline{\Psi}\,\Psi\,\overline{\Psi}}$ $\boxed{\Psi\,\overline{\Psi}\,\Psi}$ ≡ **1st creation stage** ⟶ $\Psi^{⑨}$

KP1

9 individual differential operations $D_{(5-13)}$

$D_{13} \qquad D_{12} \quad D_{11} \quad D_{10} \qquad D_5 \qquad D_6 \quad D_7 \quad D_8 \qquad D_9$

$\boxed{\Psi\,\overline{\Psi}\,\Psi}$ $\boxed{\overline{\Psi}\,\Psi\,\overline{\Psi}}$ $\boxed{\Psi\,\overline{\Psi}\,\Psi}$ $\boxed{\overline{\Psi}\,\Psi\,\overline{\Psi}}$ $\boxed{\Psi\,\overline{\Psi}\,\Psi}$ $\boxed{\overline{\Psi}\,\Psi\,\overline{\Psi}}$ $\boxed{\Psi\,\overline{\Psi}\,\Psi}$ $\boxed{\overline{\Psi}\,\Psi\,\overline{\Psi}}$ $\boxed{\Psi\,\overline{\Psi}\,\Psi}$

2nd creation stage ≡ $\boxed{\Psi^{㉗}(x;\, \xi,\, \varrho,\, \lambda,\, \eta,\, \varepsilon_1,\, \varepsilon_2,\, \varepsilon_3,\, \varepsilon_4,\, \varepsilon_5,\, \varepsilon_6,\, \varepsilon_7,\, \varepsilon_8,\, \varepsilon_9)}$ ≡ $\boxed{\Psi^{㉗}(x, \sigma_{13})}$ ⟶ $\Psi^{㉗}$
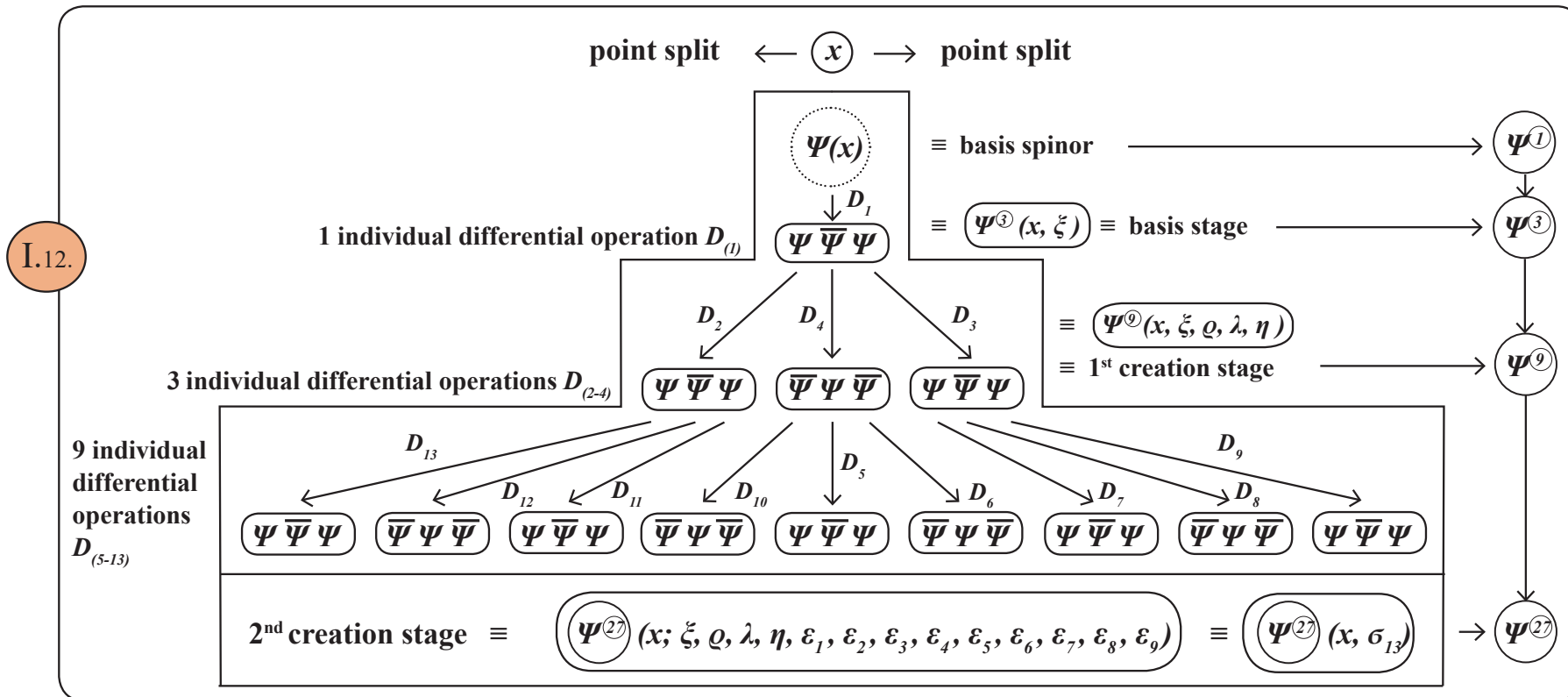
Taking into account the local arrangement – with the ordering from **II.4.** – of the 1st creation stage $\Psi^{⑨}(x,\sigma_4)$ – as well as the point split-separated 2nd creation stage $\Psi^{㉗}(x,\sigma_{13})$ created by the 2nd fundamental process – as described in **III.1.** to **III.4.**, the following specifically holds:

$\Psi^{㉗}$

III.4.1.

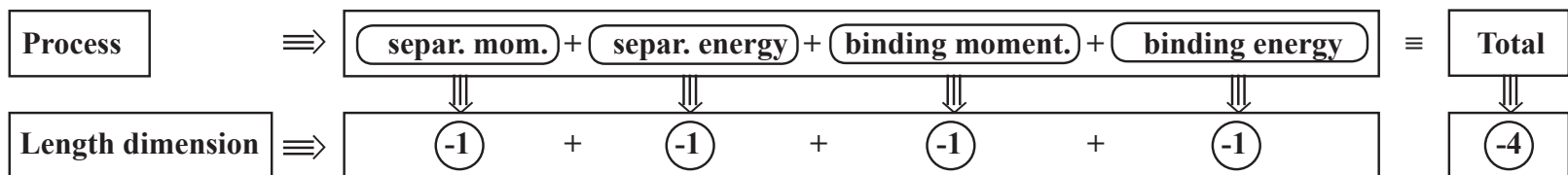| Ψ	$\overline{\Psi}$	Ψ	$\overline{\Psi}$	Ψ	$\overline{\Psi}$	$\overline{\Psi}$	Ψ	$\overline{\Psi}$	Ψ	$\overline{\Psi}$	Ψ	Ψ	$\overline{\Psi}$	Ψ	Ψ	$\overline{\Psi}$	Ψ	$\overline{\Psi}$	Ψ	$\overline{\Psi}$	$\overline{\Psi}$	Ψ	$\overline{\Psi}$	Ψ	$\overline{\Psi}$	Ψ
x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
$-\xi\,-\varrho$	$-\xi\,-\varrho$	$-\xi\,-\varrho$	$-\eta$	$-\eta$	$-\eta$	$-\xi$	$-\xi$	$-\xi$	$-\xi\,+\varrho$	$-\xi\,+\varrho$	$-\xi\,+\varrho$	0	0	0	$+\xi\,-\lambda$	$+\xi\,-\lambda$	$+\xi\,-\lambda$	$+\xi$	$+\xi$	$+\xi$	$+\eta$	$+\eta$	$+\eta$	$+\xi\,+\lambda$	$+\xi\,+\lambda$	$+\xi\,+\lambda$
$-\varepsilon_9$	0	$+\varepsilon_9$	$-\varepsilon_8$	0	$+\varepsilon_8$	$-\varepsilon_7$	0	$+\varepsilon_7$	$-\varepsilon_6$	0	$+\varepsilon_6$	$-\varepsilon_1$	0	$+\varepsilon_1$	$-\varepsilon_2$	0	$+\varepsilon_2$	$-\varepsilon_3$	0	$+\varepsilon_3$	$-\varepsilon_4$	0	$+\varepsilon_4$	$-\varepsilon_5$	0	$+\varepsilon_5$

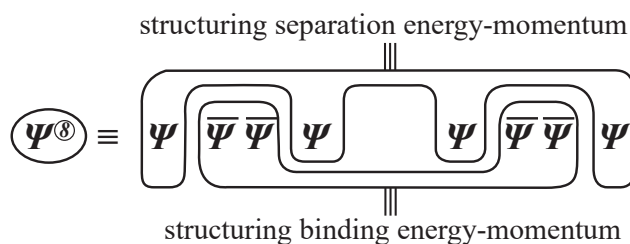**Then, the <u>structuring and preformation process</u>:**

I.8.

| Process | $\Longrightarrow$ | separ. mom. + separ. energy + binding moment. + binding energy | $\equiv$ | Total |

| Length dimension $\Longrightarrow$ | -1 + -1 + -1 + -1 | -4 |

Thus: The $\boxed{\text{overall structuring process}}$ requires a basis spinor set of $\boxed{\text{length dimension } -4}$

$\Longrightarrow$ This means: The $\boxed{\text{spinor raw material}}$ generated by $\boxed{\text{I.6.}}$ must include the $\boxed{\text{spinor subset of dimension } -4}$, required for structuring.

Since, by $\boxed{\text{I.3.}}$, the basis spinors Ψ and $\overline{\Psi}$ have dimension $-\frac{1}{2}$, $dim\ \Psi = -\frac{1}{2}$,

this must namely be a $\boxed{\text{spinor subset } \Psi^{\circledast}}$ with $\boxed{[\ dim\ \Psi^{\circledast}\ ] = [dim\ -4\ ]}$

IV.5.

structuring separation energy-momentum

The structuring foundation is $\Psi^{\circledast} \equiv \Psi\ \overline{\Psi}\ \overline{\Psi}\ \Psi\qquad \Psi\ \overline{\Psi}\ \overline{\Psi}\ \Psi$ **with the structure elements**

$\boxed{\gtrless \equiv \text{separ.}}$ and $\boxed{\cup \equiv \text{bind.}}$

structuring binding energy-momentum

Incorporating the structure $\Psi^{\circledast}$ into $\Psi^{\circledcirc}$ gives the preformation structure $\Psi^{\circledcirc}$:

V.7.

| spinors: | $\Psi\ \Psi\ \overline{\Psi}$ | $\overline{\Psi}$ | $\overline{\Psi}\ \overline{\Psi}$ | $\Psi\ \Psi$ | $\Psi\ \overline{\Psi}\ \Psi$ | $\Psi\ \Psi$ | $\overline{\Psi}\ \overline{\Psi}$ | $\overline{\Psi}\ \overline{\Psi}$ | $\overline{\Psi}\ \Psi\ \Psi$ |

| splits: | $-\xi,-\varrho,-\varepsilon_9\ \ -\xi,-\varrho,+\varepsilon_9\ \ -\eta,-\varepsilon_8$ | $-\eta,+\varepsilon_8$ | $-\xi,-\varepsilon_7\ \ -\xi,+\varepsilon_7$ | $-\xi,+\varrho,-\varepsilon_6\ \ -\xi,+\varrho,+\varepsilon_6$ | $-\varepsilon_1$ | $+\varepsilon_1$ | $+\xi,-\lambda,-\varepsilon_2\ \ +\xi,-\lambda,+\varepsilon_2$ | $+\xi,-\varepsilon_3\ \ +\xi,+\varepsilon_3$ | $+\eta,-\varepsilon_4\ +\eta,+\varepsilon_4\ \ +\xi,+\lambda,-\varepsilon_5\ +\xi,+\lambda,+\varepsilon_5$ |

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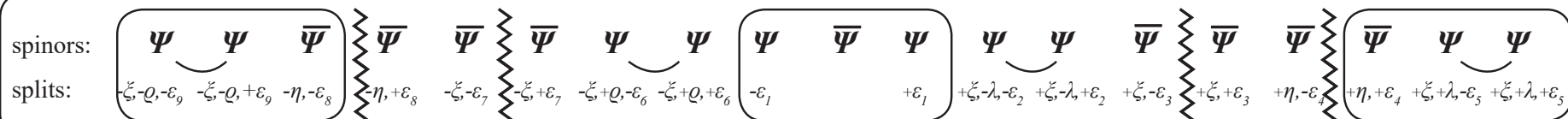
≡ **The Primordial Universe before the Big Bang** $(_5\overline{G},\ _5G,\ _2R;\ v_1,\ v_2,\ v_3)$ **with a size of around 10^{-14} cm ≡ essentially a "bulky point"**

From the

Preformation Structure $\Psi^{⑲}_{\xi U}$

spinors:
resp.
splits:

V.7.

$\Psi\ \Psi\ \overline{\Psi}$ $\overline{\Psi}\ \overline{\Psi}\ \overline{\Psi}$ $\Psi\ \Psi$ $\Psi\ \overline{\Psi}\ \Psi$ $\Psi\ \Psi\ \overline{\Psi}\ \overline{\Psi}\ \overline{\Psi}\ \overline{\Psi}\ \Psi\ \Psi$

$-\xi,-\varrho,-\varepsilon_9$ $-\xi,-\varrho,+\varepsilon_9$ $-\eta,-\varepsilon_8$ $-\eta,+\varepsilon_8$ $-\xi,-\varepsilon_7$ $-\xi,+\varepsilon_7$ $-\xi,+\varrho,-\varepsilon_6$ $-\xi,+\varrho,+\varepsilon_6$ $-\varepsilon_1$ $+\varepsilon_1$ $+\xi,-\lambda,-\varepsilon_2$ $+\xi,-\lambda,+\varepsilon_2$ $+\xi,-\varepsilon_3$ $+\xi,+\varepsilon_3$ $+\eta,-\varepsilon_4$ $+\eta,+\varepsilon_4$ $+\xi,+\lambda,-\varepsilon_5$ $+\xi,+\lambda,+\varepsilon_5$
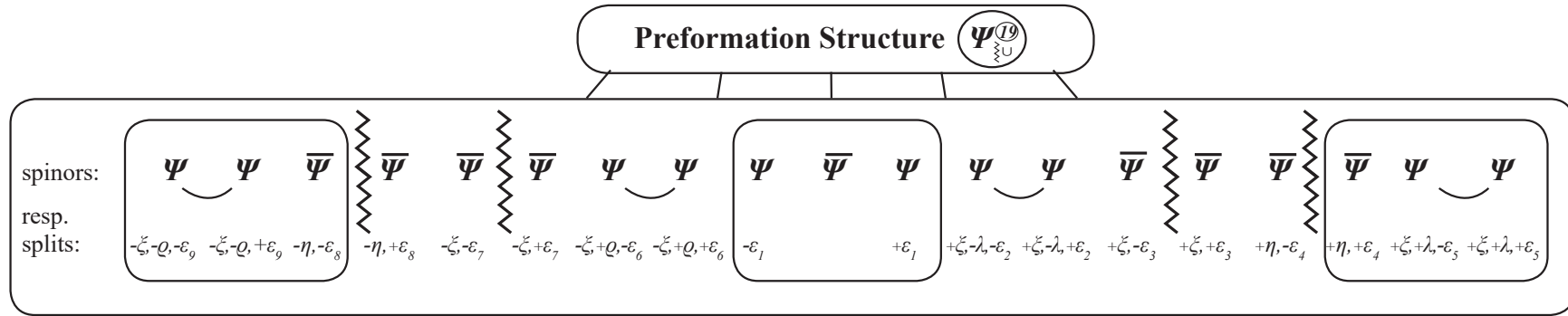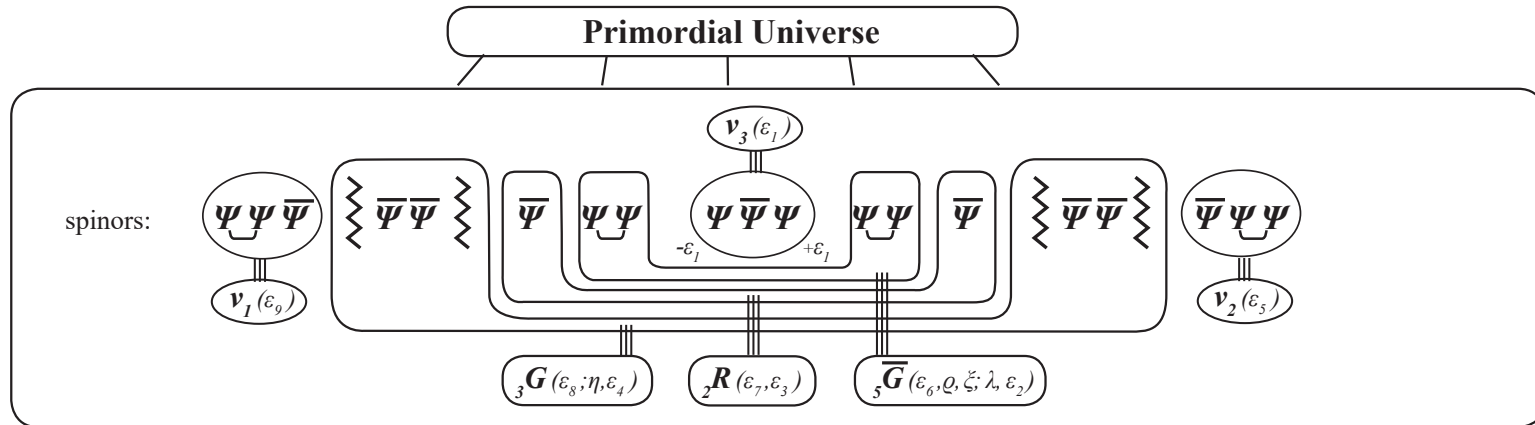
that formed according to (KP1) **, another formation process is then initiated by the fact that** $\Psi,\ \overline{\Psi}$ **are both 4-component spinors, creating the** $\Psi\Psi\Psi\Psi$ **- and** $\overline{\Psi}\,\overline{\Psi}\,\overline{\Psi}\,\overline{\Psi}$**-formation structures. The rest of the formation forms from the underlying preformation structure and the requirement that** $\Psi^{⑲}_{\xi U}$ **should have a global fermionic structure. This leads to the creation of the Primordial Universe with an inwards-maximized point split distribution:**

(KP2)

Primordial Universe

V.8.

VII.4.

spinors:

$v_3(\varepsilon_1)$

$\Psi\ \Psi\ \overline{\Psi}$ $\overline{\Psi}\ \overline{\Psi}$ $\overline{\Psi}$ $\Psi\ \Psi$ $\Psi\ \overline{\Psi}\ \overline{\Psi}$ $\Psi\ \Psi$ $\overline{\Psi}$ $\overline{\Psi}\ \overline{\Psi}$ $\overline{\Psi}\ \Psi\ \Psi$

$-\varepsilon_1$ $+\varepsilon_1$

$v_1(\varepsilon_9)$ $v_2(\varepsilon_5)$

$_3G(\varepsilon_8;\eta,\varepsilon_4)$ $_2R(\varepsilon_7,\varepsilon_3)$ $_5\overline{G}(\varepsilon_6,\varrho,\xi;\lambda,\varepsilon_2)$

The left subscript of the bosons $_5\overline{G},\ _2R,\ _3G$ indicates how many different point splits are in the inner-structural composition of the boson. For example: $_5\overline{G}$ means that $_5\overline{G}$ contains 5 different point splits.

Thus: The Primordial Universe before the Big Bang consists of

(KP2) VII.3.

3 fermions $\equiv$ (3 massless neutrinos with different structures):

$$v_1 \equiv F_1 \equiv \left(\Psi\,\Psi\,\overline{\Psi}\right)(\varepsilon_9) \qquad v_2 \equiv F_2 \equiv \left(\overline{\Psi}\,\Psi\,\Psi\right)(\varepsilon_5) \qquad v_3 \equiv F_3 \equiv \left(\Psi\,\overline{\Psi}\,\Psi\right)(\varepsilon_1)$$

as well as:

3 bosons $\equiv$ (3-force mixture):

$_5\overline{G}$	$\equiv$	most extremely strong, repulsive, absolutely dominant force
$_2R$	$\equiv$	normally strong, repulsive force
$_3G$	$\equiv$	most extremely weak, attractive force

where, by (V.6.) , (VI.3.2.) , (VI.3.3.) , (VI.3.4.) , (VI.4.)

$_5\overline{G}$ $\equiv$ $\boxed{\Psi\,\Psi \quad \Psi\,\Psi}$ $(\varepsilon_6\,,\varrho\,,\xi;\lambda,\varepsilon_2) \equiv$ (repulsive) $\equiv$ $\left(\overline{\overline{m}}\right),\ \overline{q}_0;$

$\overline{q}_0$ because of the $\Psi\Psi\Psi\Psi$-configuration, $\overline{\overline{m}}$ means extremely high mass (see VI.4.), i.e. most extremely short range ~10^{-18} cm

$_2R$ $\equiv$ $\boxed{\overline{\Psi} \quad \overline{\Psi}}$ $(\varepsilon_7,\varepsilon_3) \equiv$ (repulsive) $\equiv$ $(m);$

massive, range ~10^{-14} cm

$_3G$ $\equiv$ $\boxed{\overline{\Psi}\,\overline{\Psi} \quad \overline{\Psi}\,\overline{\Psi}}$ $(\varepsilon_8;\eta,\varepsilon_4) \equiv$ (attractive) $\equiv$ $\left(\overline{m}\right),\ q_0;$

q_0 because of the $\overline{\Psi}\,\overline{\Psi}\,\overline{\Psi}\,\overline{\Psi}$-configuration, with $\overline{q}+q=0$, $\overline{m}$ means extremely high mass, i.e. range ~10^{-14} cm
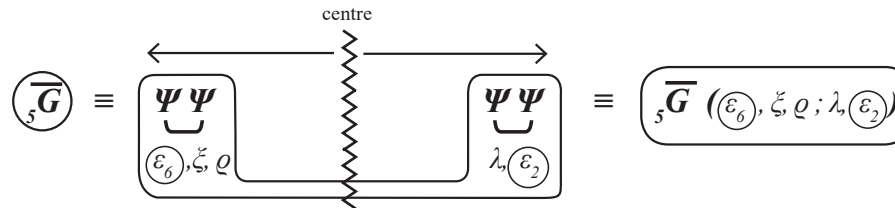
The Primordial Universe before the Big Bang was therefore a "bulky point" with a size of around 10^{-14} cm.

≡ **fundamental process of the Big Bang** ≡ **beginning of the Big Bang, i.e. the rupture process of $_5\overline{G}$ sets the Big Bang process in motion**

The formation of the first ever force boson $(_5\overline{G})$, i.e. the most extremely strong anti-gravitational force, the first ever force to emerge and exist, leads to the process that founds the Universe by means of the fundamental Big Bang process intrinsically associated with the $(_5\overline{G})$-boson
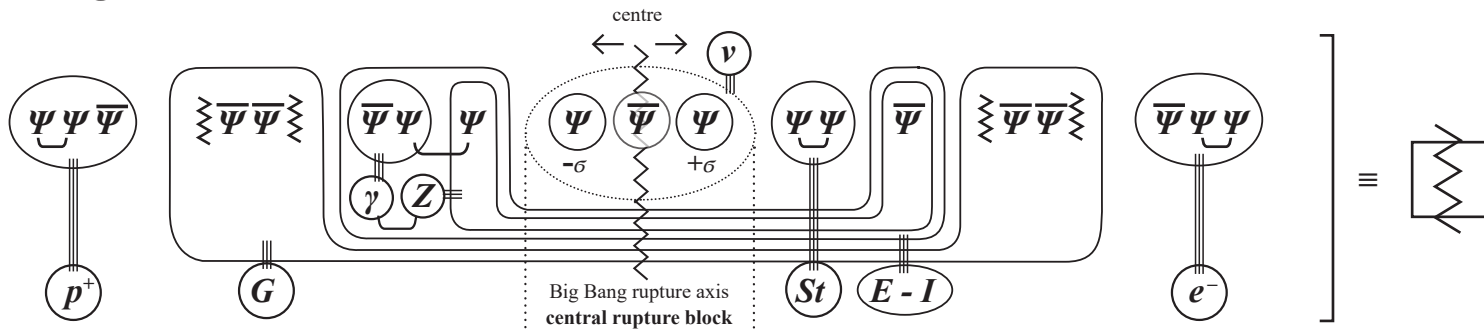

Thus: Within the whole of the Primordial Universe, this leads to a dissipation and reformation process with a point split distribution that is outwards-maximized because of the Big Bang rupture process:
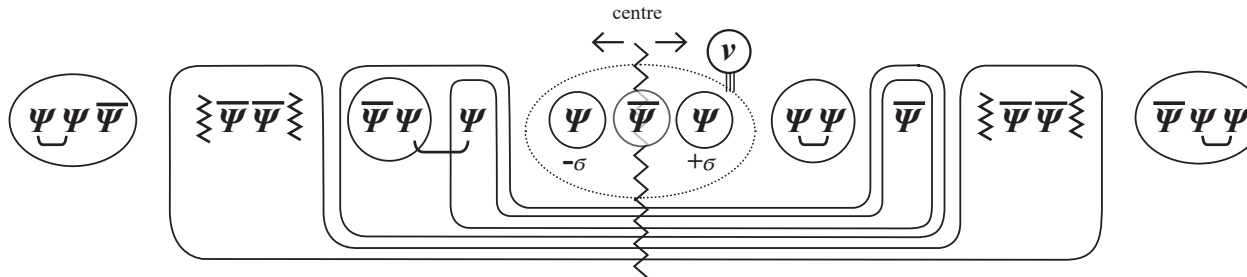
As a consequence of the rupture of $(_5\overline{G})$ (and therefore the beginning of the Big Bang), the post-Big Bang elementary set forms anew:

The elementary particle set created by the Big Bang (IX.10. , IX.11.) forms as follows after the partial decomposition of E - I → γ_Z als

X.8.

proton: p^+ $\equiv$ $\Psi \Psi \overline{\Psi}$ $(-\xi, -\varrho, -\varepsilon_8, (\pm \varepsilon_9))$ $\equiv$ 3 basis spinor - 4-split object

electron: e^- $\equiv$ $\overline{\Psi} \Psi \Psi$ $(+\eta, +\varepsilon_4, (\pm \varepsilon_5))$ $\equiv$ 3 basis spinor - 3-split object

neutrino: v $\equiv$ $\Psi \overline{\Psi} \Psi$ $((\pm \varepsilon_1))$ $\equiv$ 3 basis spinor - 1-split object

strong interaction: St $\equiv$ $\Psi \Psi$ $(-\lambda, (\pm \varepsilon_2))$ $\equiv$ 2 basis spinor - 2-split object

electromagnetic- weak interaction: γ Z $\equiv$ $\overline{\Psi} \Psi$ Ψ $\overline{\Psi}$ $(-\varepsilon_3, (\pm \varepsilon_6))$,

where the components are connected together with „$\cup$" , but nonetheless exists separately as individual physical objects (see VII.23. to VII.33)

Z $\equiv$ $\Psi ... \overline{\Psi}$ $(+\varepsilon_6, -\varepsilon_3)$ $\equiv$ 2 basis spinor - 2-split object

γ $\equiv$ $\overline{\Psi} \Psi$ (0) $\equiv$ 2 basis spinor - 0-split object

gravitonic interaction:: G $\equiv$ $\{\overline{\Psi} \overline{\Psi}\}$ $\{\overline{\Psi} \overline{\Psi}\}$ $(-\varepsilon_7)$ $\equiv$ 4 basis spinor - 1-split object
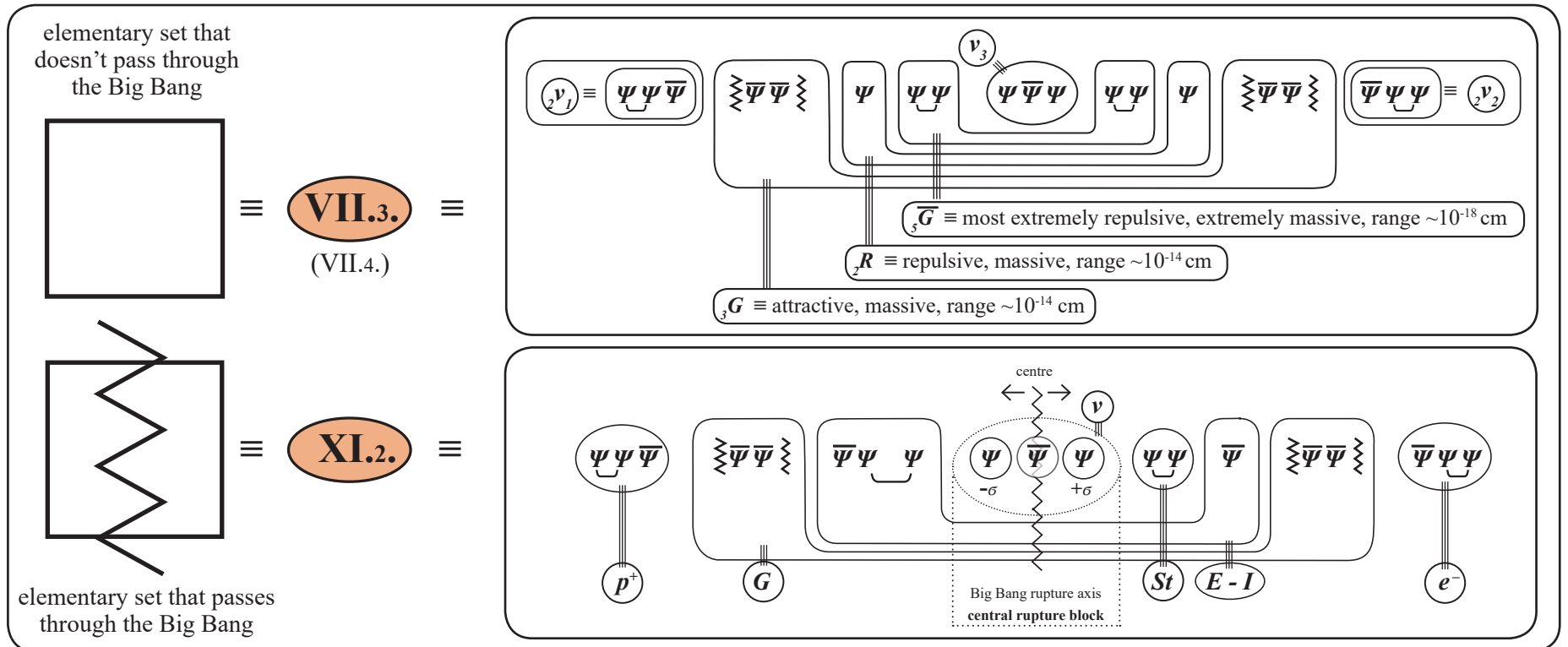
KP3

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This central Big Bang rupture axis leads to the Big-Bang-driven separation and therefore individualization of the 3 basis spinors in the central rupture region. As a result of this individualization, these 3 separated basis spinors then reform, each as the starting spinor of an independent dynamic construction process $\Psi_0 \rightarrow \Psi_0{}^{(19)}$, leading to the creation of 3 new construction systems, and thus to the creation of a 3-fold growth chain reaction (see (XI.20.), (XI.22.), (XI.23.)) :

resulting in the production of $\equiv \dfrac{3^{(n_r-1)}-1}{2} - \xi$ -particle sets

$\dfrac{3^{(n_r-1)}-1}{2}$ finely detailed mini-Big Bang events

(see (XI.2.)) $\equiv$ [Normal Matter]

$\equiv$ **Total Big Bang**

■ End of Big Bang ──────────────────────────── End of Big Bang ■

[Dark Matter] $\equiv$ **final-level production of** $\left(3^{(n_r-1)}\right)$ -□-particle sets (see (XI.2.2.), (VII.3.), (VII.4.)) with □ $\equiv$ $_2v_{1,\,2}v_{2,\,1}v_{3,\,4}\overline{G},\,_4G,\,_0R$
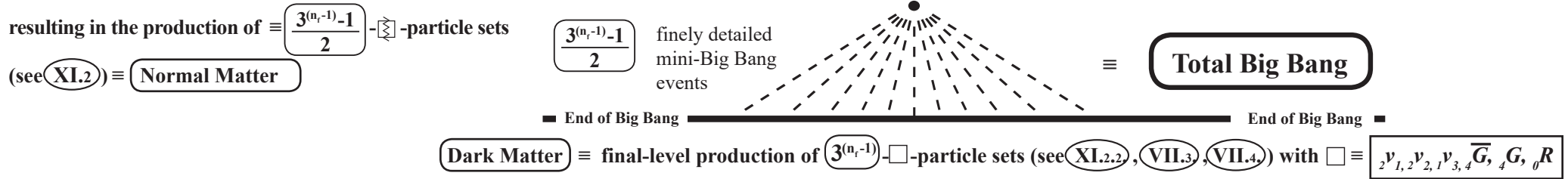
To represent the structure of this chain reaction within the most colossal Big Bang production cascade more concisely, we introduce the following symbolic notation:

(KP4)

XI.22.

elementary set that doesn't pass through the Big Bang

$\equiv$ **VII.3.** $\equiv$

(VII.4.)

$_2v_1 \equiv \boxed{\Psi\Psi\overline{\Psi}}$ $\{\overline{\Psi}\,\overline{\Psi}\}$ Ψ $\Psi\Psi$ $\Psi\overline{\Psi}\Psi$ $\Psi\Psi$ Ψ $\{\overline{\Psi}\,\overline{\Psi}\}$ $\overline{\Psi}\Psi\Psi \equiv {}_2v_2$

v_3

$_5\overline{G} \equiv$ most extremely repulsive, extremely massive, range $\sim 10^{-18}$ cm

$_2R \equiv$ repulsive, massive, range $\sim 10^{-14}$ cm

$_3G \equiv$ attractive, massive, range $\sim 10^{-14}$ cm

elementary set that passes through the Big Bang

$\equiv$ **XI.2.** $\equiv$

centre

$\leftarrow \gtrless \rightarrow$ v

$\Psi\Psi\overline{\Psi}$ $\{\overline{\Psi}\,\overline{\Psi}\}$ $\overline{\Psi}\Psi\ \Psi$ Ψ $\overline{\Psi}$ Ψ $\Psi\Psi$ $\overline{\Psi}$ $\{\overline{\Psi}\,\overline{\Psi}\}$ $\overline{\Psi}\Psi\Psi$

$-\sigma$ $+\sigma$

p^+ G Big Bang rupture axis **central rupture block** St E - I e^-
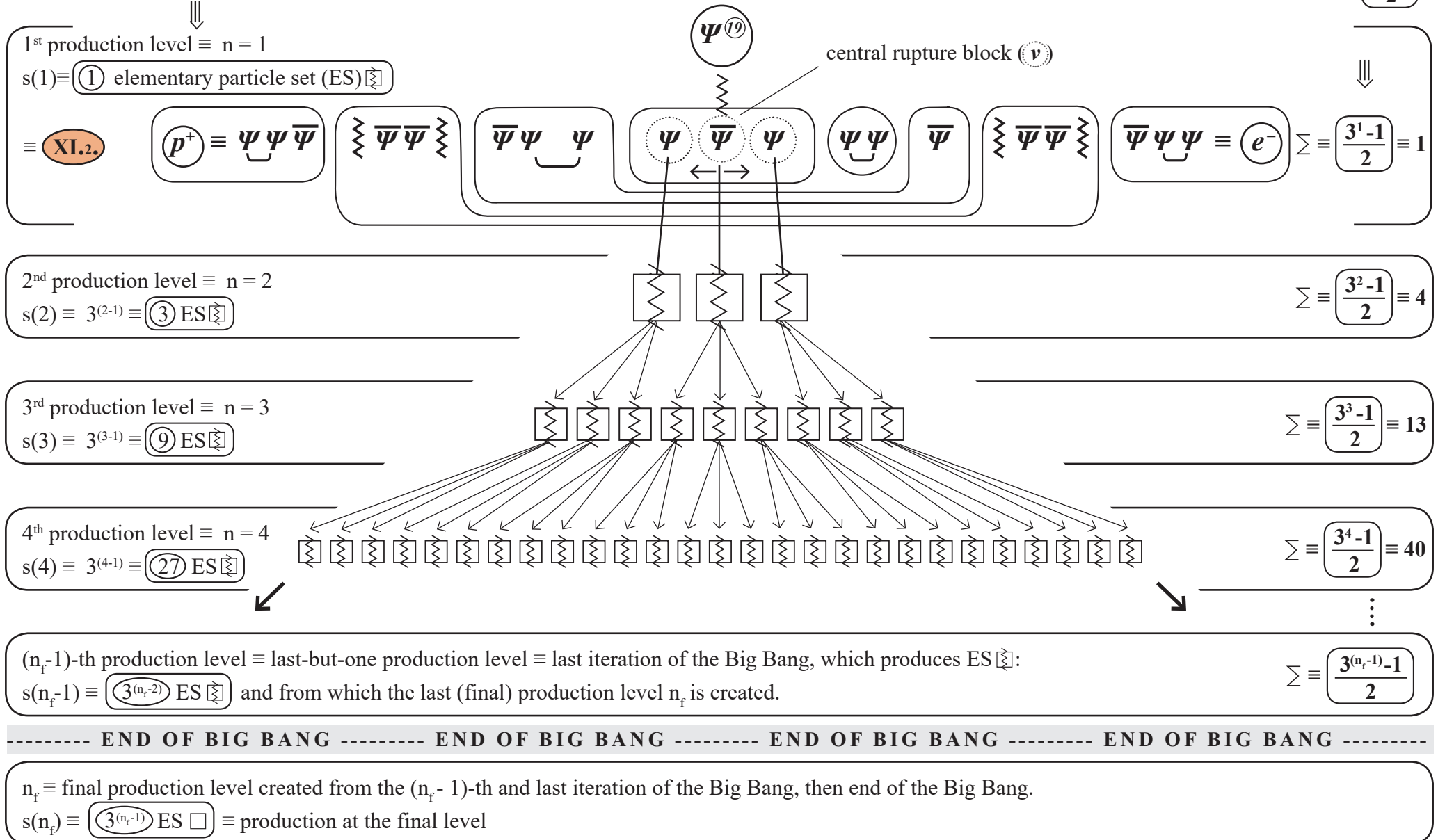
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Big Bang Production Cascade

XI.23.

n-th production level, elementary sets produced: $s(n) \equiv 3^{n-1}$ number of elementary particle sets produced so far $\sum \equiv \dfrac{3^n - 1}{2}$

$\Psi^{⑲}$ central rupture block (ν)

1st production level $\equiv$ n = 1

$s(1) \equiv ①$ elementary particle set (ES)

$\equiv$ **XI.2.** $\quad (p^+) \equiv \Psi \Psi \overline{\Psi} \quad \{ \overline{\Psi}\overline{\Psi} \} \quad \overline{\Psi}\Psi\_\Psi \quad \Psi \; \overline{\Psi} \; \Psi \quad \Psi\Psi \quad \overline{\Psi} \quad \{ \overline{\Psi}\overline{\Psi} \} \quad \overline{\Psi}\Psi\Psi \equiv (e^-) \quad \sum \equiv \dfrac{3^1 - 1}{2} \equiv 1$

2nd production level $\equiv$ n = 2

$s(2) \equiv 3^{(2-1)} \equiv ③$ ES $\sum \equiv \dfrac{3^2 - 1}{2} \equiv 4$

3rd production level $\equiv$ n = 3

$s(3) \equiv 3^{(3-1)} \equiv ⑨$ ES $\sum \equiv \dfrac{3^3 - 1}{2} \equiv 13$

4th production level $\equiv$ n = 4

$s(4) \equiv 3^{(4-1)} \equiv ㉗$ ES $\sum \equiv \dfrac{3^4 - 1}{2} \equiv 40$

$(n_f\text{-}1)$-th production level $\equiv$ last-but-one production level $\equiv$ last iteration of the Big Bang, which produces ES:

$s(n_f\text{-}1) \equiv (3^{(n_f\text{-}2)})$ ES and from which the last (final) production level n_f is created. $\sum \equiv \dfrac{3^{(n_f\text{-}1)} - 1}{2}$

--------- E N D   O F   B I G   B A N G --------- E N D   O F   B I G   B A N G --------- E N D   O F   B I G   B A N G --------- E N D   O F   B I G   B A N G ---------

$n_f \equiv$ final production level created from the $(n_f\text{-}1)$-th and last iteration of the Big Bang, then end of the Big Bang.

$s(n_f) \equiv (3^{(n_f\text{-}1)})$ ES $\square$ $\equiv$ production at the final level

XI.36. **The Components $(\frac{2}{3}, \frac{1}{3})$ of the total Universe directly after the Big Bang, and the corresponding $(6, 6) \equiv 12$ elementary particles**

Dark Matter

Component ① ≡ 66.6 %		Inner-Structural Particle Composition		by V.,VI.	Mass/Charge	Force Structure	Range	Found?
neutrino$_1$	$(_2\nu_1)$	$\Psi\Psi\overline{\Psi}$ (ε_9, ξ)	≡ 2-split fermion	⟹	massive (mass ≠ 0)			yes
neutrino$_2$	$(_2\nu_2)$	$\overline{\Psi}\Psi\Psi$ (η, ε_5)	≡ 2-split fermion	⟹	massive (mass ≠ 0)			yes
neutrino$_3$	$(_1\nu_3)$	$\Psi\overline{\Psi}\Psi$ (ε_1)	≡ 1-split fermion	⟹	massless			yes
anti-gravitational boson	$(_4\overline{G})$	$\Psi\Psi \quad \Psi\Psi$ $(\varepsilon_6, \varrho; \lambda, \varepsilon_2)$	≡ 4-split boson	⟹	extremly high mass, charge $\overline{q}_0$	most extremely strongly repulsive	10^{-17} cm	not yet
repulsive boson	$(_0R_0)$	$\overline{\Psi} \quad \overline{\Psi}$ (0)	≡ 0-split boson	⟹	massless	repulsive	long	not yet
gravitational boson	$(_4G)$	$\{\overline{\Psi}\overline{\Psi}\}\cap\{\overline{\Psi}\Psi\}$ $(\varepsilon_8, \varepsilon_7, \varepsilon_3, \varepsilon_4)$	≡ 4-split boson	⟹	massive, charge q_0	most extremely weakly attractive	10^{-15} cm	not yet
as well as the end products created from the annihilation of $(_4\overline{G}, _4G)$, including the split release products thus created, and the Dark Energy created from these and other annihilation processes.								not yet

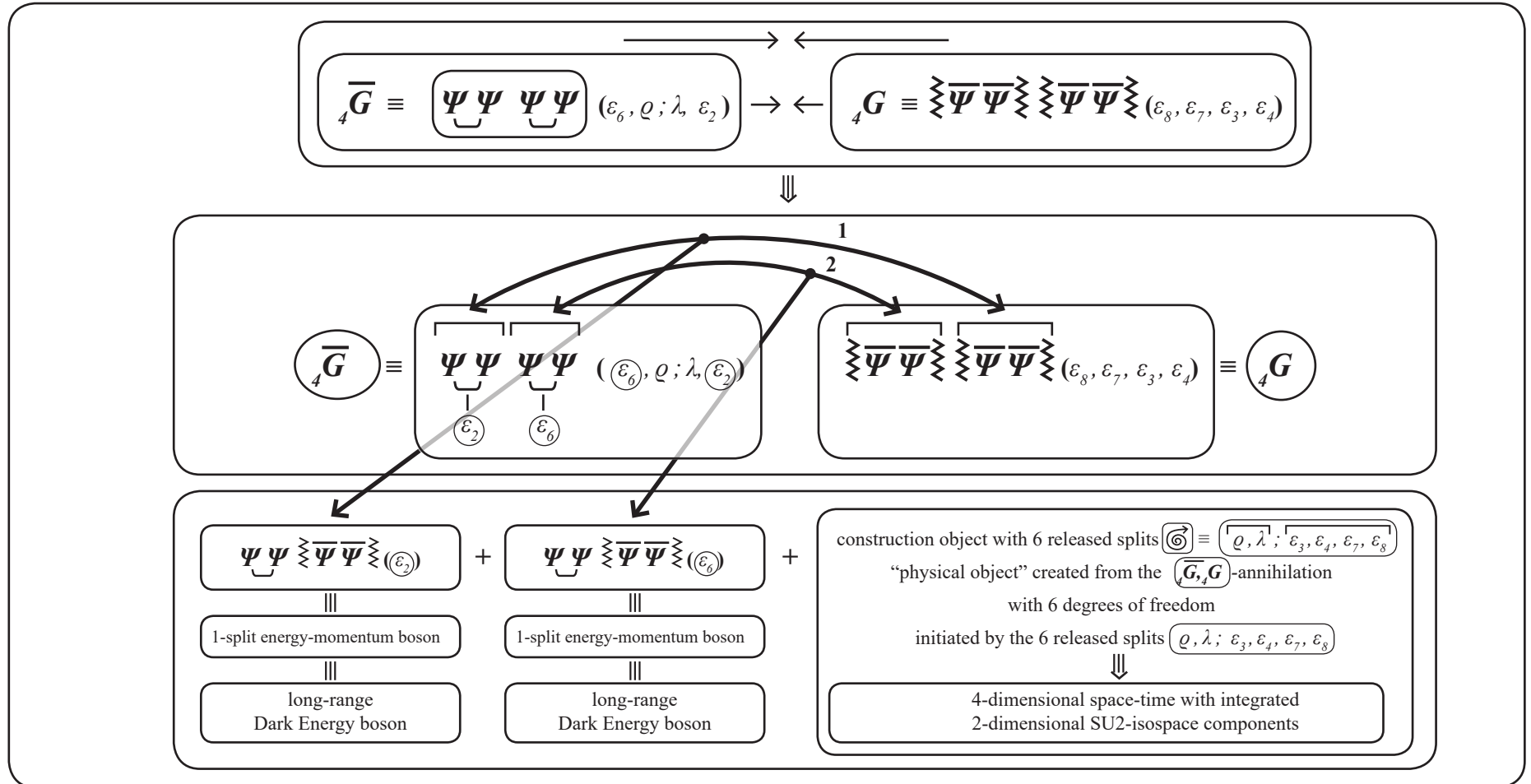### Normal Matter/Antimatter

Component ② ≡ 33.3 %		Inner-Structural Particle Composition		by V.,VI.	Mass/Charge	Force Structure	Range	Found?
proton (antiproton*)	$(p^+)(\overline{p}^-)$	$\Psi\Psi\overline{\Psi}$ $(\varepsilon_9, \xi, \varrho, \varepsilon_8)$	≡ 4-split fermion	⟹	higher mass, charge ⊕ (⊖)			yes
electron (positron*)	$(e^+)(e^-)$	$\overline{\Psi}\Psi\Psi$ $(\varepsilon_4, \eta, \varepsilon_5)$	≡ 3-split fermion	⟹	low mass, charge ⊖ (⊕)			yes
neutrino	(ν)	$\Psi\overline{\Psi}\Psi$ (ε_1)	≡ 1-split fermion	⟹	masless			yes
strong force	(St)	$\Psi\Psi$ (λ, ε_2)	≡ 2-split boson	⟹	massive, uncharged	strongly attractive	10^{-13} cm	yes
energy-momentum	$(E\text{-}I)$	$\overline{\Psi}\Psi\,\Psi\,\overline{\Psi}$ $(\varepsilon_6, \varepsilon_3)$	≡ 2-split boson	⟹				yes
partial decomposition into	$(\gamma)(Z)$	$\overline{\Psi}\Psi\,\Psi\,\overline{\Psi}$ $(\varepsilon_6, \varepsilon_3)$						yes
electromag. force	(γ)	$\overline{\Psi}\Psi$ $(0\ \text{split})$	≡ 0-split boson	⟹	massless	medium strong	long	yes
weak force	(Z)	$\Psi \quad \overline{\Psi}$ $(\varepsilon_6, \varepsilon_3)$	≡ 2-split boson	⟹	massive, uncharged	weak	10^{-15} cm	yes
gravitation	(G)	$\{\overline{\Psi}\overline{\Psi}\}\cap\{\overline{\Psi}\Psi\}$ (ε_7)	≡ 1-split boson	⟹	massless	most extremely weakly attractive	long	yes
as well as the annihilation end products $((e^+, e^-, p^+, p^-))$, see XI.29.								yes

* For the detailed point split distributions of antimatter particles, see (XI.28.)

with the coupled construction of expanding 4-dimensional space-time, created by the pair annihilation processes of Dark Matter ($_4\overline{G}$, $_4G$) as well as the pair annihilation processes of Normal Matter/Antimatter ($p^+ p^-$, $e^+ e^-$)
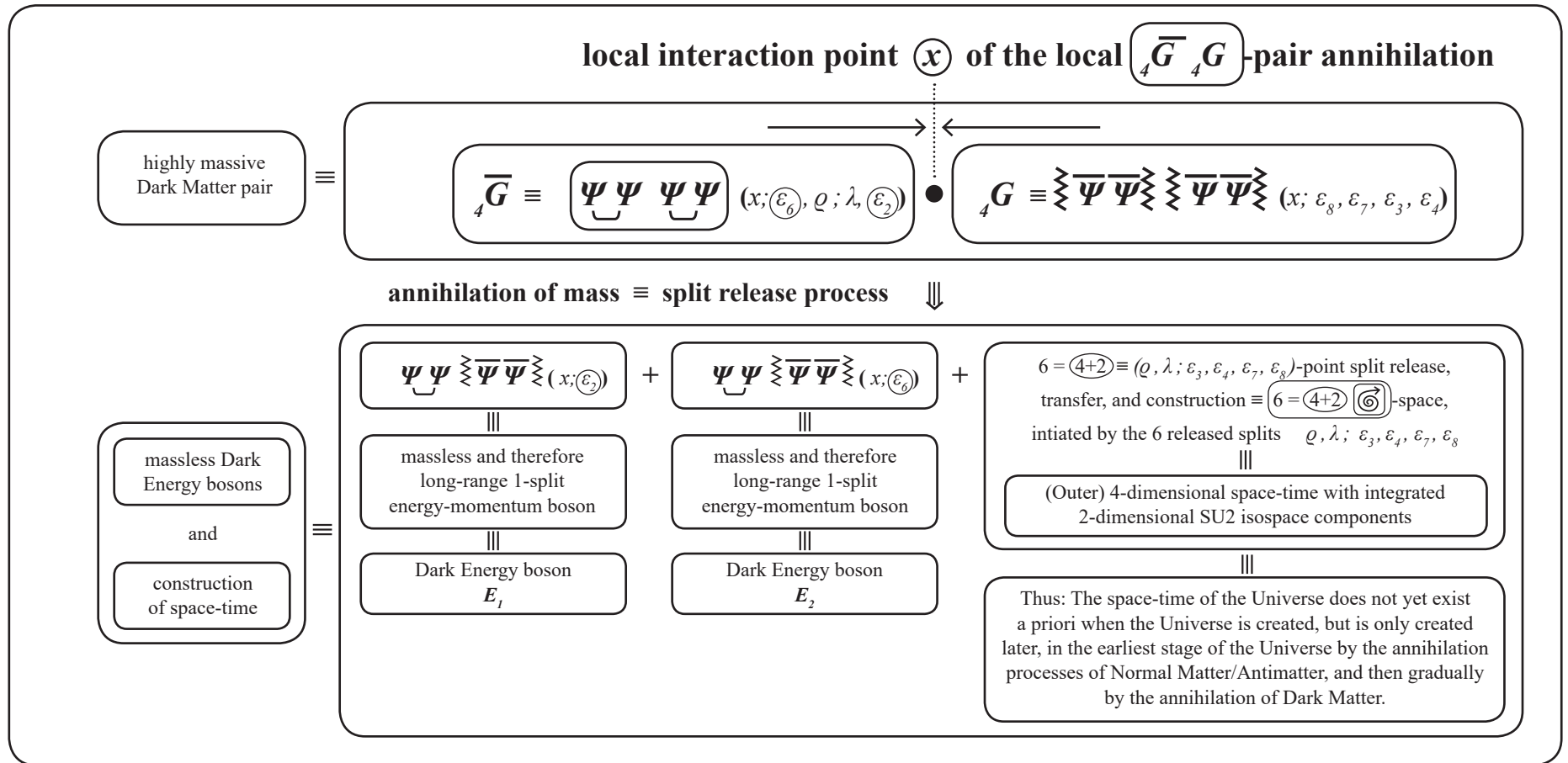
Annihilation of Dark Matter: The annihilation processes of Dark Matter and conversely the creation of Dark Energy with the coupled creation of expanding 4-dimensional space-time elementary strutures
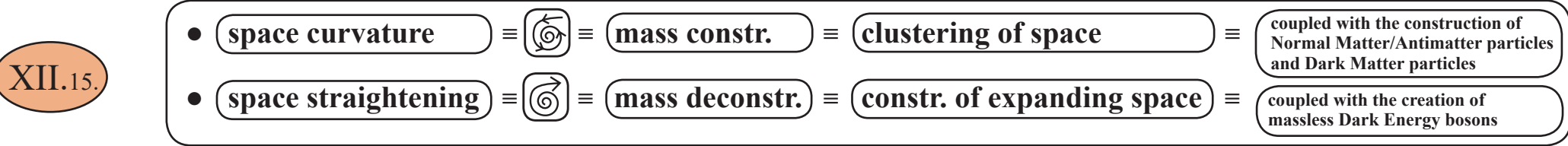
Thus

(KP6)

XII.12.

local interaction point (x) **of the local** $\boxed{_4\overline{G}\ _4G}$ **-pair annihilation**

highly massive Dark Matter pair $\equiv$

$$_4\overline{G} \equiv \boxed{\Psi\ \Psi\ \ \Psi\ \Psi}\ (x; \varepsilon_6), \varrho\ ; \lambda, \varepsilon_2)) \quad \bullet \quad _4G \equiv \{\overline{\Psi}\ \overline{\Psi}\} \{\overline{\Psi}\ \overline{\Psi}\}\ (x; \varepsilon_8, \varepsilon_7, \varepsilon_3, \varepsilon_4)$$

annihilation of mass $\equiv$ split release process $\Downarrow$

massless Dark Energy bosons

and

construction of space-time

$\equiv$

$$\boxed{\Psi\ \Psi\ \{\overline{\Psi}\ \overline{\Psi}\}\ (x; \varepsilon_2)}\quad + \quad \boxed{\Psi\ \Psi\ \{\overline{\Psi}\ \overline{\Psi}\}\ (x; \varepsilon_6)}\quad +$$

|||

massless and therefore long-range 1-split energy-momentum boson

|||

Dark Energy boson E_1

massless and therefore long-range 1-split energy-momentum boson

|||

Dark Energy boson E_2

$6 = (4+2) \equiv (\varrho, \lambda; \varepsilon_3, \varepsilon_4, \varepsilon_7, \varepsilon_8)$-point split release, transfer, and construction $\equiv \boxed{6 = (4+2)\ (6)}$-space, intiated by the 6 released splits $\varrho, \lambda; \varepsilon_3, \varepsilon_4, \varepsilon_7, \varepsilon_8$

|||

(Outer) 4-dimensional space-time with integrated 2-dimensional SU2 isospace components

|||

Thus: The space-time of the Universe does not yet exist a priori when the Universe is created, but is only created later, in the earliest stage of the Universe by the annihilation processes of Normal Matter/Antimatter, and then gradually by the annihilation of Dark Matter.

From **(XII.12.)**, it follows that: The local interaction point $(x = \bullet)$ of the $\left|\,\overline{G}^{+}_{4}\,\,G^{-}_{4}\,\right|$-pair annihilation is "straightened out" by the expanding $(4+2)$-split release $(\textcircled{6})$ – due to the annihilation of mass – or in other words "opened up". Thus: Starting from the local interaction point $(x = \bullet)$, due to the $(\textcircled{6}$-split release$)$ from the annihilation processes **(XII.12.)** the following happens:

(XII.13.)

$(\textcircled{6}$-split release act	$\equiv$	space straightening act	$\equiv$	space opening act	$\equiv$	$\circledast$-space expansion act

In EAU, **(VI.3.2.)**, it was shown that point curvature is created by (split clustering processes with split densities ≥ 2), and that this point curvature creates mass, and therefore the curvature of space is related to mass. If we symbolically write (split clustering $\equiv$ point curvature) as $(\textcircled{6})$, and the inverse act, namely (split release $\equiv$ point straightening), as $(\textcircled{6})$, then we see that:

(XII.14.)

- mass is generated at the mass point $(\bullet)$ by (split densities ≥ 2), i.e. $(\textcircled{6})$, and
- (4-dimensional space-time structure entities) are created by (split releases ≥ 4), i.e. $(\textcircled{6})$.

It follows that:

(XII.15.)

- (space curvature) $\equiv (\textcircled{6}) \equiv$ (mass constr.) $\equiv$ (clustering of space) $\equiv$ coupled with the construction of Normal Matter/Antimatter particles and Dark Matter particles
- (space straightening) $\equiv (\textcircled{6}) \equiv$ (mass deconstr.) $\equiv$ (constr. of expanding space) $\equiv$ coupled with the creation of massless Dark Energy bosons

The annihilation processes of Normal Matter/Antimatter and conversely the creation processes of energy-momentum bosons with the coupled creation of expanding 4-dimensional space-time elementary structure entities Annihilation of Normal Matter/Antimatter: Similar processes unfold within the Normal Matter/Antimatter segment.

By UEA, XI.28. , more Normal Matter formed than Antimatter during the Big Bang. Since, at the time, the "freshly" formed Universe directly after the Big Bang, i.e. directly after the Big Bang phase (see UEA, XI.23. ≡ creation phase), was a most extremely compact and most extremely massive "smallest possible structure" (some sources estimate that it was only ~10 cm in size), the Normal Matter/Antimatter pairs $(e^+ e^-)$ and $(p^+ p^-)$ were densely packed together, which necessarily led to the well-known pair annihilation processes XI.29. .
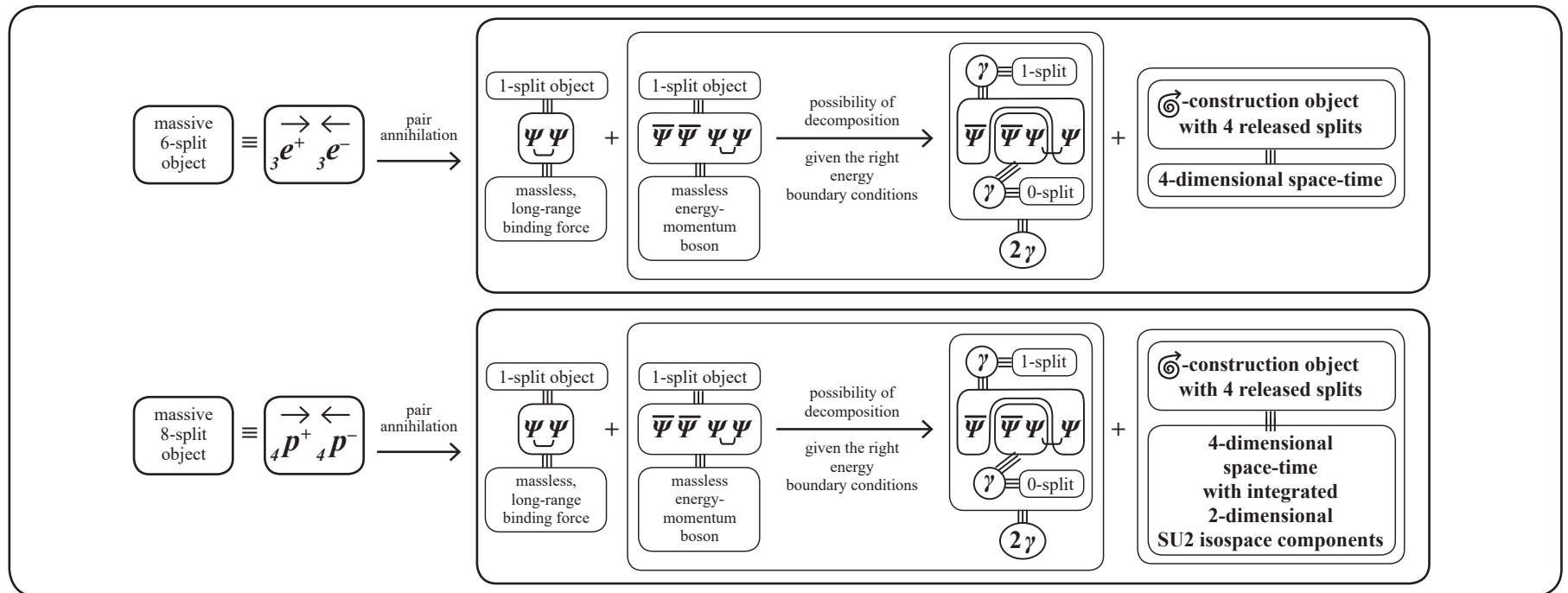
Thus, the composition of the Universe "Today" can be divided into the following 3 components (see (XII.42.)):

(KP6)

Component ① ≡ 26.8 % ≡ Dark Matter

		Inner-Structural Particle Composition	
neutrino$_1$	$_2\nu_1$	≡ $\Psi\,\Psi\,\overline{\Psi}$ (ε_9, ξ)	≡ 2-split fermion
neutrino$_2$	$_2\nu_2$	≡ $\overline{\Psi}\,\Psi\,\Psi$ (η, ε_5)	≡ 2-split fermion
neutrino$_3$	$_1\nu_3$	≡ $\Psi\,\overline{\Psi}\,\Psi$ (ε_1)	≡ 1-split fermion
anti-gravitational boson	$\overline{G}$	≡ $\Psi\,\Psi$ $\Psi\,\Psi$ $(\varepsilon_6, \varrho; \lambda, \varepsilon_2)$	≡ 4-split boson
repulsive-Boson	$_0R_0$	≡ $\overline{\Psi}$ $\overline{\Psi}$ (0)	≡ 0-split boson
gravitational boson	G	≡ $\{\overline{\Psi}\,\Psi\}\cap\{\Psi\,\Psi\}$ $(\varepsilon_8, \varepsilon_7, \varepsilon_3, \varepsilon_4)$	≡ 4-split boson

Component ② ≡ 4.9 % ≡ Normal Matter/Antimatter

		Inner-Structural Particle Composition	
proton (antiproton*)	p^+ ($\overline{p}$)	≡ $\Psi\,\Psi\,\overline{\Psi}$ $(\varepsilon_9, \xi, \varrho, \varepsilon_8)$	≡ 4-split fermion
electron (positron*)	e^+ (e^-)	≡ $\overline{\Psi}\,\Psi\,\Psi$ $(\varepsilon_4, \eta, \varepsilon_5)$	≡ 3-split fermion
neutrino	ν	≡ $\Psi\,\overline{\Psi}\,\Psi$ (ε_1)	≡ 1-split fermion
strong force	St	≡ $\Psi\,\Psi$ (λ, ε_2)	≡ 2-split boson
energy-momentum	$E\text{-}I$	≡ $\overline{\Psi}\,\Psi\,\Psi\ \overline{\Psi}$ $(\varepsilon_6, \varepsilon_3)$	≡ 2-split boson
partial decomposition into	$\gamma\,Z$	≡ $\overline{\Psi}\,\Psi\,\Psi\ \overline{\Psi}$ $(\varepsilon_6, \varepsilon_3)$	
electromag. force	γ	≡ $\overline{\Psi}\,\Psi$ (0 Split)	≡ 0-split boson
weak force	Z	≡ $\Psi\ \overline{\Psi}$ $(\varepsilon_6, \varepsilon_3)$	≡ 2-split boson
gravitation	G	≡ $\{\overline{\Psi}\,\Psi\}\cap\{\Psi\,\Psi\}$ (ε_7)	≡ 1-split boson

as well as the resulting annihilation end products ((e^+, e^-, p^+, p^-)), see XI.29.

with the coupled construction of expanding 4-dimensional space-time

Component③ ≡ **68.3 % ≡ Dark Energy with the coupled construction of expanding 4-dimensional** space-time

- **of which 28.5% ≡ energy-momentum bosons** $\overline{\varPsi}\,\overline{\varPsi}\,\varPsi\,\varPsi$ **(1-split)**
   with the coupled construction of expanding 4-dimensional space-time**,**
   created from the annihilation of a 28.5% fraction of Normal Matter/Antimatter (see XII.17. **)**

- **of which 39.8 % ≡ energy-momentum bosons** $\{\overline{\varPsi}\,\overline{\varPsi}\}\,\varPsi\,\varPsi$ **(1-split)**
   with the coupled construction of expanding 4-dimensional space-time**,**
   created from the annihilation of a 39.8% fraction of Dark Matter (see XII.12. **)**

(KP6)