Norbert Winter

UC-1

The creation of the Universe Code Ψ-19

$$\left[D^{(13)}_{\sigma_{13}} \Psi(x) \right]_{\wr\cup} \equiv \Psi^{(19)}_{\wr\cup}(x,\sigma_{13}) \equiv \Psi^{(19)}_{\wr\cup}(x) \equiv \Psi\text{-}19$$

spinors: $\Psi\ \Psi\ \overline{\Psi}\ \ \overline{\Psi}\ \ \overline{\Psi}\ \overline{\Psi}\ \ \Psi\ \Psi\ \ \Psi\ \overline{\Psi}(x)\ \Psi\ \ \Psi\ \Psi\ \ \overline{\Psi}\ \overline{\Psi}\ \ \overline{\Psi}\ \ \overline{\Psi}\ \Psi\ \Psi$

pointsplits: $-\xi,-\varrho,-\varepsilon_9\ \ -\xi,-\varrho,+\varepsilon_9\ \ -\eta,-\varepsilon_8\ \ -\eta,+\varepsilon_8\ \ -\xi,-\varepsilon_7\ \ -\xi,+\varepsilon_7\ \ -\xi,+\varrho,-\varepsilon_6\ \ -\xi,+\varrho,+\varepsilon_6\ \ -\varepsilon_1\ \ 0\ \ +\varepsilon_1\ \ +\xi,-\lambda,-\varepsilon_2\ \ +\xi,-\lambda,+\varepsilon_2\ \ +\xi,-\varepsilon_3\ \ +\xi,+\varepsilon_3\ \ +\eta,-\varepsilon_4\ \ +\eta,+\varepsilon_4\ \ +\xi,+\lambda,-\varepsilon_5\ \ +\xi,+\lambda,+\varepsilon_5$

from the dynamic elementary structure of the universe

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

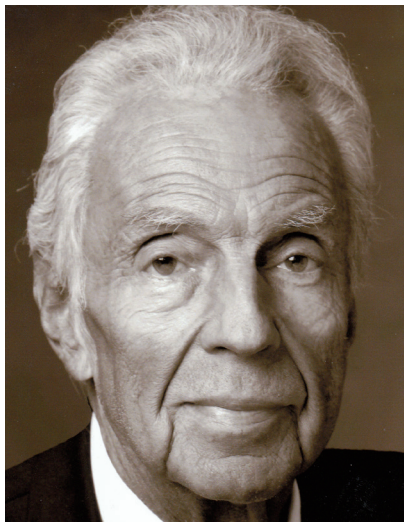
$$D\,\overline{\Psi}(x) = \overline{\Psi}(x-\sigma_2)\ \Psi(x)\ \overline{\Psi}(x+\sigma_2)\ ;\ \sigma_2 \to 0$$

$x \equiv$ ● interaction point, $D = \frac{d}{dx}$, $dx \equiv \sigma \equiv$ point split

with repulsion $\equiv$ $\leftarrow -\sigma \quad +\sigma \rightarrow$

attraction $\equiv$ $\rightarrow \bullet \leftarrow$

$\equiv$ I.1., I.2., I.3. $\equiv$ elementary structure of the universe



Norbert Winter

- Norbert Winter, born 1942, raised in Göttingen
- Studied Physics at the Universities of Heidelberg and Munich
- Doctorate in Physics with a thesis on elementary particle theory, supervisor H.P. Dürr
- Employed at the Max-Planck Institute for Physics in Munich, student of Werner Heisenberg
- 1974-2006, change of career into the insurance industry, including 25 years as board member or chairman of various insurance companies
- Despite this professional activities constant engagement with questions of logic and physics and constant contact with high-energy physicists
- From 2006, intensive engagement with questions of logic and physics
- From 2008, concrete and targeted development of the following works:

14/04/2011: “The Construction of Matter” (ADM)
06/03/2012: “Matter, Logic, and Existence” (MLE)
19/04/2013: “The Highly Massive Scalar Boson” (HSB)
26/05/2014: “The Law of Greatest Simplicity” (GDE)
22/05/2015: “The Unified Construction Process of the Universe from Smallest to Largest” (EAU, Kap. I-X.)
17/12/2015: “The Act of Creation of the Universe” (UEA)
04/08/2016: “The Development Process of the Universe from the Big Bang until Today” (UEP)
17/03/2017: “The 6 Key Processes in the Creation and Development of the Universe” (KPU)
17/03/2017: “The Universe Code Ψ-19” (UC)
17/03/2017: “The Universe Code Ψ-19, the unified composition and order system of the Universe“ (UC-AOS)
16/02/2018: “Guide to the source and generating code of the Universe“ (WW-UEC)
16/02/2018: “The Universe Code Ψ-19, the creation system of the entire process of the universe“ (UC-G)
16/02/2018: “UC-1 – The creation of the Universe Code Ψ-19“
16/02/2018: “UC-2 – The Universe Code Ψ-19,
- The creation system of the first ever manifestation of the universe before the big bang (≡ primordial universe)
- The creation system of mass and charge“

16/02/2018: “UC-3 – The Universe Code Ψ-19, the creation system of the big bang (rupture of ${}_5G$) in the primordial universe
- The restructuring of the elementary particle set that has passed through the Big Bang
- the formation of the normal matter elementary particle set = $\overbrace{p^+, e^-, \nu ; St, \underbrace{\gamma, Z}, G}$ ≡ h-atom given suitable energy boundary conditions“

16/02/2018: “UC-4 – The Universe Code Ψ-19, the creation system:
- of the Big Bang Reproduction Cascade including absolutely all fine and global composition structures of the Earliest Universe directly after the Big Bang ($\frac{2}{3}$ Dark Matter / $\frac{1}{3}$ Normal Matter)
- of the elementary particles of Dark Matter and Normal Matter including their inner-structural particle composition and their physical properties“

16/02/2018: “UC-5 – The Universe Code Ψ-19, the creation system of dark energy with the coupled construction of 4-dimensional space-time“

Preface:

After publication of the paper

The universe code Ψ-19,
the unified composition and order system of the universe

≡ UC-AOS (abbr.)

I have received numerous letters with the question:

1. of whether it would be possible - due to the abundance of the overall material and the breadth of the topic of the paper UC-AOS (Chapter I. - XIV., 356 pages) - to recommend a guide with the help of which one can find a clear path through the overall text of the paper

2. what, according to my opinion and with respect to the present overall situation of elementary particle physics and space physics, are the most important topics on either field

3. Some letters contained the question of whether it would be possible to represent the overall universe process as developed in UC-AOS in full details, in a closed, neatly arranged form on approx. 30-50 pages.

4. In other letters, the request was made to split the comprehensive paper UC-AOS into its 5-6 core topics, whereas each of these 5-6 core topics should be 30-50 pages in length, thus easily readable and preferably deal with a topic that is currently being discussed.

The questions 1. and 2. have been answered in the paper:

> **Guide to the source and generating code of the Universe at small scale (elementary particles) and at large scale (global structures of the Universe)** (2/16/2018).

The third question has been dealt with within the paper:

> **The universe code Ψ-19,**
> **the generation system of the complete universe process** (2/16/2018).

Question 4 is dealt with within the following 5 papers **UC-1** $\rightarrow$ **UC-5**:

UC-1 (02/16/2018)
UC-2 (02/16/2018)
UC-3 (02/16/2018)
UC-4 (02/16/2018)
UC-5 (02/16/2018)

We start with UC-1:

The present work **„UC-1“** refers to the work UC-AOS.
Therefore, the numerical references used in the following text refer to the numerical representation of the paper UC-AOS.

Thus, the reader can directly navigate to the text within the entire paper UC-AOS and retrieve the required information from the relevant text passages, in case further information on a certain subject is needed.

The foundations:
The question of the most elementary of all possible structural compositions of the Universe.
Principle of minimality, fundamental interaction, point split, identity principle.

To the best of our current knowledge, the Universe is 13.8 billion years old.
But this immediately raises the question: What was there before this beginning of the Universe?
Or, to state this question more precisely: What did the Universe arise from at that time, and how?
We currently know that there was a Big Bang 13.8 billion years ago. But again, this leaves the questions of what existed before this Big Bang, and why it happened, unanswered.
So: Right at the beginning – before the Big Bang – there must have been some existential act that created a "Something" – whatever the nature of this Something may have been – or, to phrase it philosophically, a something that is "not Nothing". Determining the nature of this most elementary Something we therefore pose the question:

- **Does there exist a most elementary Something, i.e. a most elementary basic structure, that cannot be decomposed into something more elementary still?**
- **If there does exist such a most elementary Something, what are its properties?**
- **And furthermore: Does this most elementary basic structure intrinsically possess a construction principle that initiates the construction processes required to fully and unequivocally create real matter (matter particles and force particles), i.e. the building blocks of the Universe?**
  Remark: Throughout the text, the concept of "matter" refers to both substance matter and force matter, i.e. anything that is physically measurable.

The answer to this question is, as developed and presented below:

- **There does exist such a universal elementary particle-generating process.**
- **This process is based on the principle of greatest simplicity (minimality principle) (see "The Law of Greatest Simplicity" (GDE), 26/05/2015).**

I.0.

- **The most fundamental basis entity in this creation process is the most general possible physical and mathematical entity, i.e. a spinor Ψ. Thus and only thus can all other physical and mathematical entities be constructed, by taking suitable products of these basis spinors, including**

  scalars, vectors, tensors, higher-level structured spinors, etc.

  Thus: In the elementary particle creation process, since this process strictly satisfies the principle of greatest simplicity (minimality principle), there only exist the basis spinors Ψ, and nothing else, i.e. there are no other basis entities.

- **The creation process of the most elementary matter is fundamentally dynamic, i.e. the basis spinors Ψ only exist in a strictly non-linear interaction structure. By the principle of greatest simplicity (minimality principle), this interaction structure must have the simplest possible structure.**

Thus: The following holds, writing $D \equiv \frac{d}{dx}$ for the differential operator and $dx \equiv \sigma \equiv$ point split:

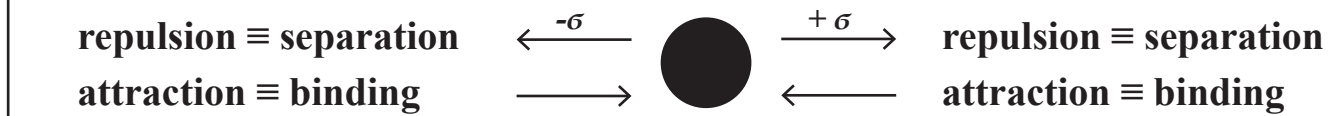
The fundamental dynamic underlying the elementary particle creation process is:

I.1. $$D\,\Psi(x) = \Psi(x-\sigma_\alpha)\;\overline{\Psi}(x)\;\Psi(x+\sigma_\alpha)\;; \qquad \sigma_\alpha \equiv \text{point split with } \sigma_\alpha \to 0$$

I.2. $$D\,\overline{\Psi}(x) = \overline{\Psi}(x-\sigma_\beta)\;\Psi(x)\;\overline{\Psi}(x+\sigma_\beta)\;; \qquad \sigma_\beta \equiv \text{point split with } \sigma_\beta \to 0$$

The following point split dynamic therefore holds:

I.2.1. **with ≡ ● ≡ interaction point, point split dynamic $\sigma \neq 0$, $\sigma \to 0$**



If (I.1.) and (I.2.) hold independently from each other, then both $\Psi(x)$ and $\overline{\Psi}(x)$ must be spinors with four components, for the following reason:

From (I.1.), it holds that: $D\,\underset{1}{\Psi} = \underset{2}{\Psi}\,\underset{3}{\overline{\Psi}}\,\underset{4}{\Psi}$ and, from (I.2.), it holds that: $D\,\underset{5}{\overline{\Psi}} = \underset{6}{\overline{\Psi}}\,\underset{7}{\Psi}\,\underset{8}{\overline{\Psi}}$,

and so if both (I.1.) and (I.2.) hold together, there exists the following spinor structure.

I.2.2.

Ψ is a $\Psi = (\underset{1}{\Psi}, \underset{2}{\Psi}, \underset{4}{\Psi}, \underset{7}{\Psi})$ -spinor, and so a (4-component spinor)

$\overline{\Psi}$ is a $\overline{\Psi} = (\underset{3}{\overline{\Psi}}, \underset{5}{\overline{\Psi}}, \underset{6}{\overline{\Psi}}, \underset{8}{\overline{\Psi}})$ -spinor, and so also a (4-component spinor)

The physical meaning of the point split σ in (I.1.) and (I.2.) is based on the fact that the fundamental interaction $D\,\Psi = \Psi\,\overline{\Psi}\,\Psi$ and $D\,\overline{\Psi} = \overline{\Psi}\,\Psi\,\overline{\Psi}$ cannot occur at a fixed point x, since the (differential operator D) that sets the interaction in motion by definition (forms a point split) by (forming the differential operator $\frac{d}{dx}$) and thus forming (dx), since this (dx) is in fact precisely the point split σ itself, i.e. (dx) $\equiv \sigma$.

In other words: The existence of a fundamental interaction structure automatically implies the existence of the differential operator ($D \equiv \frac{d}{dx}$), which in turn, writing (dx) $\equiv \sigma$, automatically implies the existence of the (point split σ), and the equality between the left and right sides of equations (I.1.) and (I.2.) is necessarily satisfied.

I.3.

From the fundamental interaction: $D\,\Psi = \Psi\,\overline{\Psi}\,\Psi$ and $D\,\overline{\Psi} = \overline{\Psi}\,\Psi\,\overline{\Psi}$, it follows that:
By definition, the differential operator D has a so-called length dimension of -1 (definition: *dim* D = -1). Therefore, it follows from the fundamental interaction that:

Length dimension of Ψ $= -\frac{1}{2}$; $dim\ \Psi = -\frac{1}{2}$ **Length dimension of $\overline{\Psi}$ $= -\frac{1}{2}$; $dim\ \overline{\Psi} = -\frac{1}{2}$,**

and it therefore also holds that the fundamental interaction I.1., I.2. has a dimensionless coupling constant, and therefore can be renormalized. This is also why, for simplicity of notation, the dimensionless coupling constant in I.1., I.2. is not explicitly stated, as it does not hold any significance for the structure of the interaction.

It follows that: The basis spinors $\Psi(x)$ and $\overline{\Psi}(x)$ are not observable entities.
In any phase of the Universe, observable entities satisfy the following:

I.4.

- **observable fermions have dimension $-\frac{3}{2}$ and are therefore $\Psi^{(3)}$-objects** *1)
- **observable bosons have dimension -1 or -2 and are therefore $\Psi^{(2)}$- or $\Psi^{(4)}$-objects**
- **observable energy-momentum-formations $E - I$ have dimension -2 and are therefore $\Psi^{(4)}$-objects, where energy has dimension -1 and momentum has dimension -1**

*1) **Remark: the notation $\Psi^{(n)}$, n =1, 2, 3, 4 means: spinor product of n spinors, including both Ψ and $\overline{\Psi}$.**
This notation can also be used in general for n > 4, in which case it refers to the point split-separated local neighbourhood (x, σ).

In the most elementary creation process of the Universe, the following identity principle holds:

I.5.

- **In the most elementary creation process, no 2 or more elementary entities are created identically.**
- **Whenever the most elementary dynamic creation process reaches a situation in which 2 identical elementary entities might be created, the dynamic process is intiated by the fundamental dynamic I.1. and I.2., which either**

I.5.1.

- **dynamically extends or restructures the creation system (in terms of the specific relations between the basis spinors),**

I.5.2.

- **in such a way that, as a result of this extension or restructuring, there ultimately do not exist any 2 (or more) identical entities in the most elementary creation process.**

The above identity principle I.5. is the "MOST FUNDAMENTAL LOGICAL AND ONTOLOGICAL PRINCIPLE" and is the "all-powerful designing principle" governing the physical existence and creation process of the Universe and its intrinsic most elementary forces.

The presentation below will systematically indicate whenever this identity principle I.5. of the original creation process applies to the situation at hand.

I.6.

Intiated by the fundamental dynamic I.1., I.2., I.3. and governed by the identity principle I.5., I.5.1., I.5.2. – before the first creation process of the Universe actually physically manifests – there unfolds a multi-stage creation process of basis spinor collections in the split neighbourhood x,σ of the local origin of the interaction x, which, over the course of the subsequent development of the creation process, becomes the local centre x of the Universe as it forms.

The creation process of the Universe thus continues until the dynamically generated basis spinor raw material satisfies the following two necessary conditions for the creation of elementary particles, in accordance with the principle of greatest simplicity (minimality principle):

I.7.

I.7.1. **Elementary particle creation condition ① ≡ ET 1:**
The spinor raw material generated by the fundamental dynamic I.1. and I.2. must be structurable in such a way that – by means of this structuring – identifiable physical entities can be obtained, i.e. it must be possible to form the structuring momentum and structuring energy required for structuring from the spinor raw material thus generated.

I.7.2. **Elementary particle creation condition ② ≡ ET 2:**
Once the structuring process of the spinor raw material is complete following its creation, i.e. once the structuring entities have formed, and once the structuring momentum and structuring energy required for this structuring have been consumed and the corresponding structuring output has concluded, there must remain sufficient additional dynamically generated basis spinor raw material left over in order for the individual, observable and therefore identifiable elementary particles, i.e. $\Psi^{(n)}$-objects, $n \geqq 2$, to form according to I.4..

These elementary particle creation conditions having the following meanings:

Explanation of ET 1:

Any structuring process of a set necessarily involves separating parts of this set and binding together parts of this set.

I.8.

Thus: Every structuring process occurs via the sub-processes "separation" and "binding". Each of these two structuring acts requires its own structuring momentum and structuring energy. So: In the fundamental elementary particle creation process, and before any manifestation of reality, there must form

both a separation momentum and a separation energy as well as a binding momentum and a binding energy

which then in turn begin to act.

Since – as we already know – both momentum and energy have a length dimension of -1, in order for the structuring processes of separation and binding to occur, a spinor subset with the following dimension must be available:

I.8.

Process	⟹	separation mom. + separation energy + binding mom. + binding energy	≡	Total
		⇓ ⇓ ⇓ ⇓		⇓
Length dimension	⟹	(-1) + (-1) + (-1) + (-1)		(-4)

⇓

I.8.1. **Thus: The overall structuring process requires a basis spinor set of length dimension (-4)**

⟹ **This means: The spinor raw material generated according to I.6. must include a spinor subset of dimension (-4) as the structuring foundation required to complete the structuring.**

Since, by I.3., the basis spinors Ψ and $\overline{\Psi}$ both have dimension $-\frac{1}{2}$, i.e. $dim\ \Psi = -\frac{1}{2}$ and $dim\ \overline{\Psi} = -\frac{1}{2}$, this must namely be a spinor subset $\Psi^{(8)}$ with $[\ dim\ \Psi^{(8)}\ ] = [dim\ (-4)\ ]$, where the notation $\Psi^{(8)}$ means: a spinor product of 8 basis spinors Ψ or $\overline{\Psi}$, i.e. including both Ψ- and $\overline{\Psi}$-spinors.

This structuring foundation $\Psi^{(8)}$ can be subdivided into one $\Psi^{(4)}$-separation component and one $\overline{\Psi}^{(4)}$- binding component; for details, see IV.5. and V.4..

Thus: The elementary matter particle creation conditions ET 1, ET 2, (I.7. and I.8.) determine the minimum volume of spinor raw material I.6. that must be generated by the fundamental dynamic I.1. and I.2. – in the split-open local neighbourhood x,σ, namely:

I.9.

The following volume is required:

in order to satisfy ET 1 (structuring of the spinor set) (see I.7.): precisely 8 basis spinors

in order to satisfy ET 2 (creation of each most elementary matter particle) (see I.7.), additionally:

to generate each elementary particle fermion: 3 basis spinors

to generate each elementary particle boson: 2 or 4 basis spinors

which means: even if we assume the existence of only one most elementary matter fermion at least 3 basis spinors

Since the total spinor material I.6., I.7., to be generated is a highly dense spinor $\Psi^{(n)}(x,\sigma)$ – where n is odd – in the split local neighbourhood x,σ as a result of the requirements placed on the creation structure constructed by the fundamental dynamic I.1., I.2., I.3. and since ET 1 (structuring) requires an even number of basis spinors, specifically 8, at least one elementary particle fermion $\Psi^{(3)}$, must be created in order for ET 2 to be satisfied, i.e. one elementary particle with an odd number of basis spinors.

It follows that:

The dynamically generated spinor raw material (see I.9.) must include at least:

I.10.

8	+	3 + ...	≡	11 + ... basis spinors
from most elementary matter creation condition 1 ≡ ET 1 , see I.7.		from most elementary matter creation condition 2 ≡ ET 2 , see I.7.		from most elementary matter creation conditions 1,2 ≡ ET 1, ET 2, see I.7.

Thus: The elementary particle creation process constructs itself as simply as possible,

or in other words by means of the most minimal construction structure that could possibly form from the

fund. dynamic I.1. ≡ $D\,\Psi(x) \equiv \lim_{\sigma_\alpha \to 0} \Psi(x-\sigma_\alpha)\ \overline{\Psi}(x)\ \Psi(x+\sigma_\alpha)$ **and I.2. ≡** $D\,\overline{\Psi}(x) \equiv \lim_{\sigma_\beta \to 0} \overline{\Psi}(x-\sigma_\beta)\ \Psi(x)\ \overline{\Psi}(x+\sigma_\beta)$

– i.e. from the simplest possible non-linear structure, given I.3. .

The creation logic followed by this construction structure is based on the principle that every basis spinor dynamically generated by the process I.1. and I.2. is once again exposed to the fundamental dynamic while the system still remains open, i.e. so long as the point split σ is $\neq 0$, i.e. the limit value at the point split, $lim\ \sigma = 0$ is not attained. Thus:

The elementary particle creation process continues
until the elementary particle creation conditions ET 1 and ET 2 (see I.7.) are satisfied.

This implies:
The elementary particle construction structure develops from the fundamental dynamic I.1., I.2., I.3. in the form of an open system in the 1st point split phase: point split $\sigma \neq 0$, $\sigma \rightarrow 0$, but point split σ not yet = 0 i.e. in the point split-open local neighbourhood x,σ, $\sigma \neq 0$ and is completed – as shown later in detail (see I.12.) – by means of precisely 13 systemically necessary individual differential operations, where each individual differential operation has the same type as the fundamental dynamic I.1., I.2., I.3., and each such instance of the fundamental dynamic acts upon precisely one single basis spinor Ψ or $\overline{\Psi}$ – locally separated by the point split (while $\sigma \neq 0$).
This number of 13 individual differential operations is the smallest possible number that satisfies the requirements ET 1, ET 2, (see I.7.).

It follows that: $D^{(13)}$ develops as follows in the point split-open local neighbourhood x,σ_{13}, over the course of 3 phases (see diagram I.12.):

I.11.

1 differential operation $D^{(1)}$ $\Rightarrow$ basis stage $\Psi^{(3)}$, not sufficient – by ET 1 –

$\Rightarrow$ another 3 differential operations $D^{(2\text{-}4)}$ $\Rightarrow$ 1st creation stage $\Psi^{(9)}$, not sufficient – by ET 2 –

$\Rightarrow$ another 9 differential operations $D^{(5\text{-}13)}$ $\Rightarrow$ 2nd creation stage $\Psi^{(27)}$, sufficient – by ET 1 and ET 2 –

$\Rightarrow$ the creation process is complete.

Thus, the elementary particle construction process is a cascade of precisely 13

individual differential operations $D^{(1,\ 2\text{-}4,\ 5\text{-}13)} \equiv D^{(13)}\ (x,\sigma_{13})$ in the point split-open local neighbourhood x,σ_{13}

each driven by the fundamental dynamic I.1., I.2., I.3. and unfolding at specific, separated points in space-time $x,\sigma_{(1+3+9)}$, where each point split is generated by the corresponding differential operation.

This gives the following elementary particle creation and composition structure in the form of a structured process dynamically generated by the fundamental dynamic I.1., I.2., I.3. via 13 specific individual differential operations :

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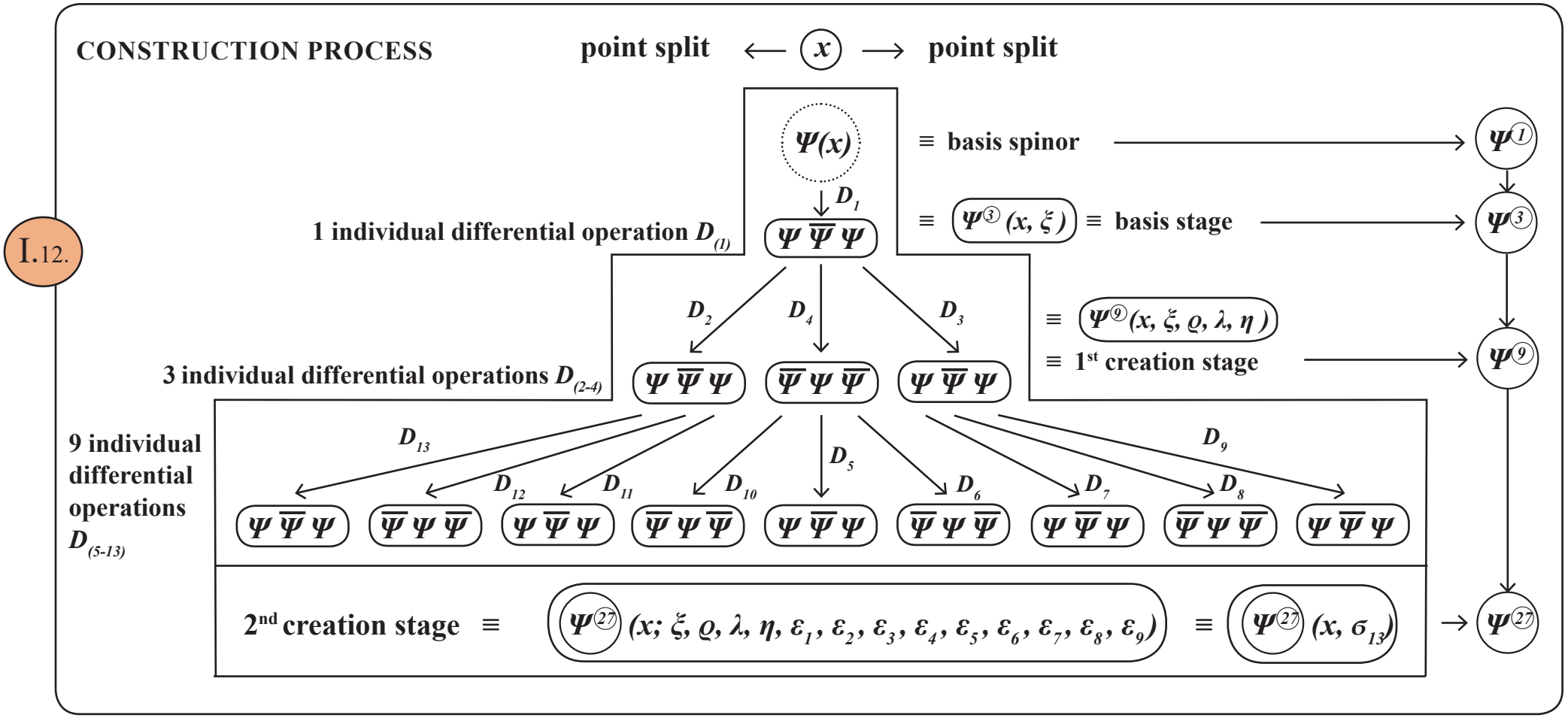


Thus: Since, in the system opening phase $\sigma_{13} \neq 0$, the spinor construction product $\Psi^{(27)}(x, \sigma_{13})$ is localized within the split neighbourhood (x, σ_{13}), the Pauli principle is not violated. The individual physical objects that will subsequently be generated in the system closing phase $\sigma \rightarrow 0$ (see Chap. VI. ff.) have at most 4 inner basis spinors and therefore satisfy the Pauli principle as $\Psi^{(4)}$-objects in the particle creation process.

The dynamic creation logic according to which the spinor set of raw material required for the elementary particle creation process is constructed – in accordance with I.9., I.10., I.12. – originates from the fact that, in the fundamental dynamic

$D\,\Psi \equiv \lim_{\xi \to 0} \Psi(x-\xi)\ \overline{\Psi}(x)\ \Psi(x+\xi)$, **due to the point split formation contained by this dynamic** $\xi \neq 0$, $\overset{-\xi}{\leftarrow}\ x\ \overset{+\xi}{\rightarrow}$

– in the first phase of the point split process – i.e. in the system opening phase $\sigma \neq 0$**, before the limit value** $lim\ \sigma = 0$ **is reached in the final phase of the point split process, the following holds:**

The 3 spinors of the basis state $\Psi^{③}(x, \xi)$**, see I.12., still form an open system such that** $\xi \neq 0$ **i.e. have not yet been bound by the attainment of the limit value** $lim\ \xi = 0$ **.**

These 3 individual spinors of the basis stage $\Psi^{③}(x, \xi)$ **– which are still open in the 1st stage of the point split event** $\xi \neq 0$ **(i.e. still exist in an open interaction) – each develop their own system-intrinsic interaction potential as individual basis spinors of** $dim\ -\ \frac{1}{2}$ **existing at separate points in space-time** $x-\xi$, x, $x+\xi$**, where** $\xi \neq 0$ **,before they are bound by the attainment of the limit** $lim\ \xi = 0$**. Thus, they construct the global system already initiated by the fundamental dynamic I.1., I.2., I.3. – as described structurally in I.12. – step by step, as follows (see I.13.):**

The original creation of the spinor collection from the fundamental interaction according to the minimality principle: $D^{(13)}\,\Psi(x) \equiv \Psi^{(27)}(x,\sigma_{13})$. The creation of the most elementary form of structuring: separation-binding from the system-intrinsic pointsplit dynamic.

That means: This construction process (I.12 .) unfolds as follows (with the specific 9 individual differential operations $D^{(v)}$, with $v = 5, \ldots 13$, where each $D^{(v)}$ acts upon the 1st creation stage $\Psi^{(9)}(x, \sigma_4)$ created by the 1st fundamental process in the point split-separated local neighbourhood x,σ_4. Thus, the process generates the additional 9 point splits $(\varepsilon_1,\ldots, \varepsilon_9)$)

III.1. $D^{(9)}\,\Psi^{(9)}(x, \sigma_4) \equiv \Psi^{(27)}(x, \sigma_{13})$ with $\sigma_{13} = (\xi, \varrho, \lambda, \eta, \varepsilon_1, \varepsilon_2, \varepsilon_3, \varepsilon_4, \varepsilon_5, \varepsilon_6, \varepsilon_7, \varepsilon_8, \varepsilon_9)$

where the incorporation of $\Psi^{(9)} \equiv D^{(4)}\,\Psi(x)$ means that: in the point split-open system – i.e. before the $lim\ \sigma = 0$ is attained, the following holds:

III.2. $$D^{(9)}_{\sigma_9}\,(\Psi^{(9)}(x, \sigma_4)) = D^{(9)}_{\sigma_9}\,(D^{(4)}_{\sigma_4}\,\Psi(x)) = D^{(13)}_{\sigma_{13}}\,\Psi(x) = \Psi^{(27)}(x, \sigma_{13})$$

namely within the split-open global process, i.e. while $\sigma \neq 0$

III.3. $$D^{(13)}_{\sigma_{13}}\,\Psi(x) \equiv \Psi^{(27)}(x, \sigma_{13}) \quad \text{with} \quad lim\ \sigma_{13} = (\xi, \varrho, \lambda, \eta, \varepsilon_1, \varepsilon_2, \varepsilon_3, \varepsilon_4, \varepsilon_5, \varepsilon_6, \varepsilon_7, \varepsilon_8, \varepsilon_9) \longrightarrow 0$$

III.3. satisfies **both fundamental elementary particle creation conditions for the global system**,
namely **ET 1**, **ET 2** (see **I.7.**) and thus **I.10.** is also satisfied.

This also concludes the creation process of the **total spinor raw material**, i.e. the **spinor collection** $\Psi^{(27)}(x, \sigma_{13})$ generated strictly by the fundamental dynamic **I.1.** and **I.2.** in the point split-separated local neighbourhood x, σ_{13} is a $\Psi^{(27)}$**-product** that satisfies the elementary particle creation conditions **ET1** and **ET2**. This prompts the development of the elementary particle creation structure **unequivocally initiated by the fundamental dynamic**.
All physically existing elementary particles must exhaustively and unequivocally form from this structure,
as does in fact occur – as shown later (UC-2, UC-3, UC-4, UC-5).

However, we shall first give a full representation of the $\Psi^{(27)}(x, \sigma_{13})$ **-collection**,
showing the detailed point split structure:

Thus: The 2nd fundamental process leads to the creation of a dynamic spinor collection of (27) spinors in the neighbourhood of the local point (x), with the 13 independent point splits $\sigma_{(13)} \equiv \xi, \eta, \varrho, \lambda, \varepsilon_1, \varepsilon_2, \varepsilon_3, \varepsilon_4, \varepsilon_5, \varepsilon_6, \varepsilon_7, \varepsilon_8, \varepsilon_9,$

III.4

$$\Psi^{(27)} \equiv$$

$$\Psi(x-\xi+\varrho-\varepsilon_6)\ \overline{\Psi}(x-\xi+\varrho)\ \Psi(x-\xi+\varrho+\varepsilon_6)\ \Psi(x-\varepsilon_1)\ \overline{\Psi}(x)\ \Psi(x+\varepsilon_1)\ \Psi(x+\xi-\lambda-\varepsilon_2)\ \overline{\Psi}(x+\xi-\lambda)\ \Psi(x+\xi-\lambda+\varepsilon_2)$$

$$\Psi(x-\xi-\varrho-\varepsilon_9)\ \overline{\Psi}(x-\xi-\varrho)\ \Psi(x-\xi-\varrho+\varepsilon_9)\ \overline{\Psi}(x-\eta-\varepsilon_8)\ \Psi(x-\eta)\ \overline{\Psi}(x-\eta+\varepsilon_8)\ \overline{\Psi}(x-\xi-\varepsilon_7)\ \Psi(x-\xi)\ \overline{\Psi}(x-\xi+\varepsilon_7)$$

$$\overline{\Psi}(x+\xi-\varepsilon_3)\ \Psi(x+\xi)\ \overline{\Psi}(x+\xi+\varepsilon_3)\ \overline{\Psi}(x+\eta-\varepsilon_4)\ \Psi(x+\eta)\ \overline{\Psi}(x+\eta+\varepsilon_4)\ \Psi(x+\xi+\lambda-\varepsilon_5)\ \overline{\Psi}(x+\xi+\lambda)\ \Psi(x+\xi+\lambda+\varepsilon_5)$$

$$\equiv$$

$$\Psi^{(13)}\ \overline{\Psi}(x)\ \Psi^{(13)}$$

Alternatively to the representation III.4. – for conciseness – the following box form can also be used as a representation of $\Psi^{(27)}$:

Example: $\Psi(x - \xi - \varrho - \varepsilon_9)$ may be written as

Ψ ← spinor
x ← origin of interaction
$-\xi\ -\varrho$ ← point split of the 1st fundamental process
$-\varepsilon_9$ ← point split of the 2nd fundamental process

Thus, the 2nd creation stage $\Psi^{(27)}(x, \sigma_{13})$ in the point split-open local neighbourhood x, σ_{13} may be fully represented as:

III.4.1.

$\Psi^{(27)}$

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	$+\varepsilon_5$

$\equiv$

$\Psi^{(13)}\ \overline{\Psi}(x)\ \Psi^{(13)}$

This spinor set $\Psi^{(27)}$ contains 3 categories of spinors:

III.5.

I **8 basis spinors originating from the 1st creation stage**
(spinors whose point split does not contain an ε-split)

II **18 basis spinors from the 2nd creation stage, each containing one ε-split**

III **and, of course, the $\Psi(x)$-spinor, which was carried through both fundamental processes at the local origin of interaction x without a split.**

$\equiv$ II + III = 18 + 1 $\equiv$ 19 basis spinors

III.5.1.

Thus: I + II + III $\equiv$ 27 basis spinors in the point split-separated local neighbourhood

Because of the point split-dynamically generated structure of the spinor collection $\Psi^{(27)}(x, \sigma_{13})$ (see III.4.)
there is a fundamental distinction between the 8 original basis spinors generated by the 1st creation stage II.2..
This distinction arises from the fundamental order and structure created by the fundamental point split process at the origin of interaction x, i.e. the centre x of the overall system $\Psi^{(27)}(x, \sigma_{13})$.

III.6.1.

point split prozess

① opening: $\xi \neq 0,\ \eta \neq 0 \Longrightarrow$ $\overset{-\xi \quad +\xi}{\leftarrow x \rightarrow}$; $\overset{-\eta \quad +\eta}{\leftarrow x \rightarrow}$ ≡ repulsion process ≡ separation process

② closing: $\xi \rightarrow 0,\ \eta \rightarrow 0 \Longrightarrow$ $\underset{-\xi \quad +\xi}{\rightarrow x \leftarrow}$; $\underset{-\eta \quad +\eta}{\rightarrow x \leftarrow}$ ≡ attraction process ≡ binding process

Therefore, within $\Psi^{(27)}(x, \sigma_{13})$, i.e. the spinor collection containing the set of spinors necessarily generated – according to ET2 – in the split-open local neighbourhood x, σ_{13}, there exists the following – point split-dynamically generated – distinction between the basis spinors that were created earlier in the 1st creation stage.

III.6.2.

the 4 Ψ-spinors, that split directly at the origin of interaction x,

i.e. the spinors with primary splits, are

namely $\Psi(x-\xi)\ \Psi(x-\eta)\ \Psi(x+\xi)\ \Psi(x+\eta)$, i.e. ξ and η are primary splits according to II.2.

and

the 4 $\overline{\Psi}$-spinors, that split at the interaction point $x \pm \xi$ – i.e. at an interaction point $x \pm \xi$ already containing a primary split –

are spinors with secondary splits ϱ , λ and are,

namely $\overline{\Psi}(x-\xi-\varrho)\ \overline{\Psi}(x-\xi+\varrho)\ \overline{\Psi}(x+\xi-\lambda)\ \overline{\Psi}(x+\xi+\lambda)$, i.e. ϱ and λ are secondary splits according to III.6.

This structuring process, which originates from the original act of creation (construction process III.1.) and necessarily occurs at the most fundamental level – since it is point split-dynamically initiated around the origin of interaction x – constructs the following systemically necessary structuring entities:

separation momentum, separation energy **as well as** **binding momentum, binding energy** .

By means of this structuring foundation, the total raw material $\Psi^{(27)}(x, \sigma_{13})$ generated by the fundamental dynamic builds structure "from within itself", i.e. from the inside outwards, and without any external trigger. This structuring therefore occurs as a most fundamental system-intrinsic act. The intrinsic structuring of the raw material $\Psi^{(27)}$ already represents the development of the rough structure of the first ever manifestation of the Universe.

All of this occurs during the open point split event $\sigma \neq 0$, $\sigma \rightarrow 0$, i.e. during the system opening phase, in which the global system initiated by the fundamental dynamic I.1., I.2., I.3. is released throughout a multi-stage elementary particle creation process – in accordance with I.12. – developing the global system step by step.

This most fundamental phase of the creation process of the Universe continues until physically real objects have formed for the first time within the Universe, namely the most elementary of all representable objects, the most elementary force/matter entities, as derived and presented in Chapter VII.
In other words: Until the first events in the history of the Universe have created all of the "material" that induces the Big Bang. However, we shall first consider a representation of the system-intrinsic structuring process of $\Psi^{(27)}$.

The original creation of the structuring process from the point split dynamic.
The construction of the structuring foundation $\Psi^{(8)}$ and the creation of the structure elements
$\lesssim$ ≡ separation ≡ repulsion and $\cup$ ≡ binding ≡ attraction

By means of the point split proces (see I.2.1.):

IV.0.

First point split $\sigma \neq 0$: $\leftarrow x \rightarrow$ (repulsion)

Then point split $\sigma \rightarrow 0$: $\rightarrow x \leftarrow$ (attraction)

the structuring dynamic that will be developed by the global system according to III.7. is released:

IV.1.

The splits ξ and η (and no others) split directly at the point of interaction x – as shown in III.6.1. – and are therefore primary splits.

In this primary separation process, the 4 spinors of the $\Psi^{(27)}(x, \sigma_{13})$-system directly associated with the primary splits $-\xi, -\eta, +\xi, +\eta$ (see III.4. and in particular III.4.1.), namely:

IV.2.

$\Psi(x-\xi)$ ... $\Psi(x-\eta)$ ... $\Psi(x+\xi)$ ... $\Psi(x+\eta)$ orm into the separation energy-momentum necessary by I.8.1. to endow the spinor set $\Psi^{(27)}(x, \sigma_{13})$ with the structure of 4 separating elements ... $\lesssim$ ... $\lesssim$ ... $\lesssim$ ... $\lesssim$ ... .

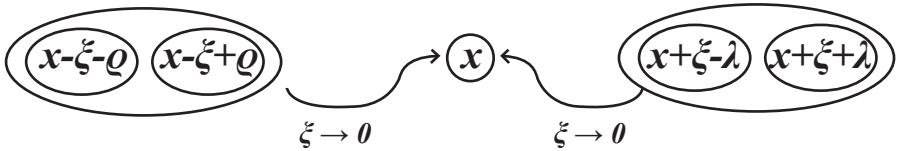
The binding structure works analogously:

The spinors of $\Psi^{(27)}$ **≡ III.4. at the local points** $(x\text{-}\xi\text{-}\varrho),\ (x\text{-}\xi\text{+}\varrho),\ (x\text{+}\xi\text{-}\lambda),\ (x\text{+}\xi\text{+}\lambda)$ **, – thus also without an** ξ**-split – have a binding effect, since the splits** $\varrho,\ \lambda$ **of these spinors are not directly located at the origin of interaction** x**, or in other words they are not primary splits, but instead split at points in space-time** $(x \pm \xi)$ **that already have an** ξ**-split, and thus are secondary splits.**

As a consequence of this, the dynamic point split process:

first, point split $\sigma \neq 0$ **(here** $\xi \neq 0$**), then, point split** $\sigma \to 0$ **(here** $\xi \to 0$**) acts as a binding structure as** $\xi \to 0$**.**

IV.3.



IV.4.

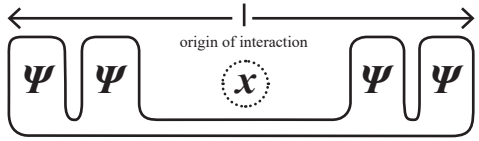
Thus: There exists the binding energy-momentum :

$$(E \oplus I)_{binding} = (\overline{\Psi}(x\text{-}\xi\text{-}\varrho) \ldots \overline{\Psi}(x\text{-}\xi\text{+}\varrho) \ldots \overline{\Psi}(x\text{+}\xi\text{-}\lambda) \ldots \overline{\Psi}(x\text{+}\xi\text{+}\lambda))$$

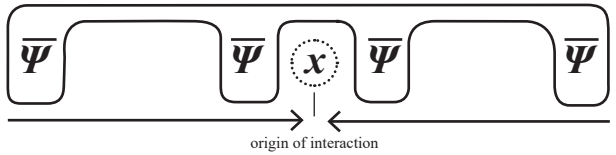
This causes the following dynamic system process to unfold: "First, point split $\sigma \neq 0$**" and "then, point split** $\sigma \to 0$**".**

This creates the structuring required by the process: separation and binding (see III.6.2.)

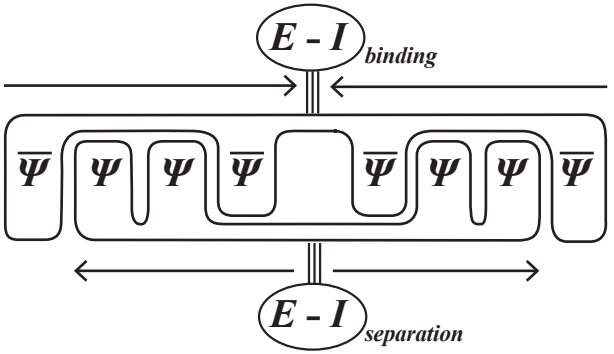
namely as structuring separation energy-momentum ≡ $E - I_{separation}$ ≡



and structuring binding energy-momentum ≡ $E - I_{binding}$ ≡



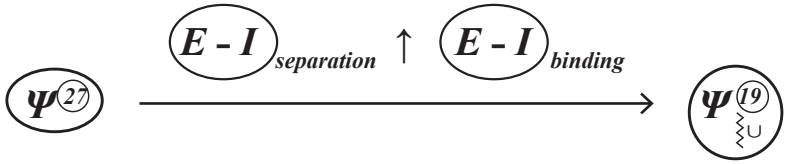
IV.5. **The structuring foundation is** $\Psi^{(8)} \equiv$



(see III.7.)

Thus: In the 3rd fundamental process, the separation and binding energy-momentum ≡ $\Psi^{(8)}$ begins to act (see I.8.1.).
This action causes it to be consumed as the structuring is completed, creating the subsequently active separation and binding elements „ ≷ “ and „ ∪ “ in the resulting $\Psi^{(19)}$-spinor set .

IV.6.



Thus, the $\Psi^{(19)}$-spinor collection, structured with the structural elements ≷ ≡ separation and ∪≡ binding in order to allow particle formation, is unequivocally generated as follows:

IV.7.

The individual spinors that make up the $E-I_{separation}$ act with a structuring effect and are consumed by this structuring action, forming the separation energy-momentum, namely $E-I_{separation}$, which acts from the inside of $\Psi^{(27)}$.

Wherever these $E-I_{separation}$-spinors act, the

separation structure element ≷ is created.

The **bindings-energy-momentum** ≡ $E-I_{binding}$, works analogously, namely:

IV.8.

The individual spinors that make up the $E-I_{binding}$ act with a structuring effect and are consumed by this structuring action, forming the binding energy-momentum $E-I_{binding}$, which acts from the inside. This binding action is what consumes them. Wherever these $E-I_{binding}$-spinors act, the

binding structure element ∪ is created.

And this leads to the construction of the preformation structure Ψ-19 and the resulting first creation act of the primordial universe.

- **The construction of the preformation structure** $\left[D^{(13)}_{\sigma_{13}} \Psi(x) \right]_{\wr\cup} \equiv \Psi^{(19)}_{\wr\cup}(x,\sigma_{13}) \equiv \Psi^{(19)}_{\wr\cup}(x) \equiv \Psi\text{-}19$
- **The formation of the boson force structure, caused by the most fundamental structuring process: "separation" and "binding", driven by the point split dynamic, and the formation of the fermion structure, driven by the preformation structure and the minimality principle.**

By means of the 1st, 2nd, and 3rd fundamental processes, and after IV.2. and IV.4. begin to act according to IV.7. and IV.8. respectively, the structured $\Psi^{(19)}$-set is created from $\Psi^{(27)}$ together with its dynamically generated point split sets as follows: $\Psi^{(27)} \xrightarrow{E\text{-}I_{separation} \uparrow E\text{-}I_{binding}} \Psi^{(19)}_{\wr\cup}$ **and may therefore be represented as follows:**

V.1. **Preformation Structure** $\Psi^{19}_{\wr\cup}$

$$\underbrace{\Psi(x\text{-}\xi\text{-}\varrho\text{-}\varepsilon_9)\,\Psi(x\text{-}\xi\text{-}\varrho\text{+}\varepsilon_9)\,\overline{\Psi}(x\text{-}\eta\text{-}\varepsilon_8)}_{F_1} \wr \underbrace{\overline{\Psi}(x\text{-}\eta\text{+}\varepsilon_8)\,\overline{\Psi}(x\text{-}\xi\text{-}\varepsilon_7)\,\Psi^{(9)}(x,\xi,\varepsilon_7,\varrho,\varepsilon_6,\varepsilon_1,\varepsilon_2,\varepsilon_3)\,\overline{\Psi}(x\text{+}\xi\text{+}\varepsilon_3)\,\overline{\Psi}(x\text{+}\eta\text{-}\varepsilon_4)}_{G} \wr \underbrace{\overline{\Psi}(x\text{+}\eta\text{+}\varepsilon_4)\,\Psi(x\text{+}\xi\text{+}\lambda\text{-}\varepsilon_5)\,\Psi(x\text{+}\xi\text{+}\lambda\text{+}\varepsilon_5)}_{F_2}$$

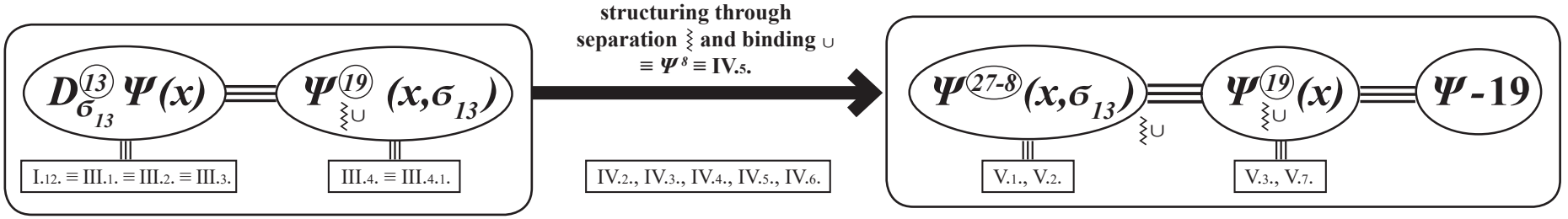
V.2. **with**

$$\Psi^{(9)} \equiv \overline{\Psi}(x\text{-}\xi\text{+}\varepsilon_7)\,\Psi(x\text{-}\xi\text{+}\varrho\text{-}\varepsilon_6)\,\Psi(x\text{-}\xi\text{+}\varrho\text{+}\varepsilon_6)\,\underbrace{\Psi(x\text{-}\varepsilon_1)\,\overline{\Psi}(x)\,\Psi(x\text{+}\varepsilon_1)}\,\Psi(x\text{+}\xi\text{-}\lambda\text{-}\varepsilon_2)\,\Psi(x\text{+}\xi\text{-}\lambda\text{+}\varepsilon_2)\,\overline{\Psi}(x\text{+}\xi\text{-}\varepsilon_3) \equiv \Psi^{(9)}$$

where both structurally identical parts $\wr\,\overline{\Psi}\,\overline{\Psi}\,\wr$ and $\wr\,\overline{\Psi}\,\overline{\Psi}\,\wr$ must be combined together into $G \equiv \overline{\Psi}\,\overline{\Psi}\,\overline{\Psi}\,\overline{\Psi}$ **by the identity principle I.5.**

The underlying structure of all physical events $\Psi^{(19)}_{\wr\cup}$ has developed – as shown in full detail in UC-AOS, Chap. 1-4 – according to I.12. , via the following multi-stage equation system of differential processes. This overall system of equations builds up successively via 13 individual nonlinear differential operations of elementary type I.1. , I.2. , I.3. as specified in I.12. . In other words, I.12. is the starting point. From this develops:

V.1.1.



V.1.2.

Thus

$$\left[D^{(13)}_{\sigma_{13}}\Psi(x)\right]_{\wr\cup} \;\; \Psi^{(19)}_{\wr\cup}(x,\sigma_{13}) \;\; \Psi^{(19)}_{\wr\cup}(x) \;\; \Psi\text{-}19$$

V.1.3.

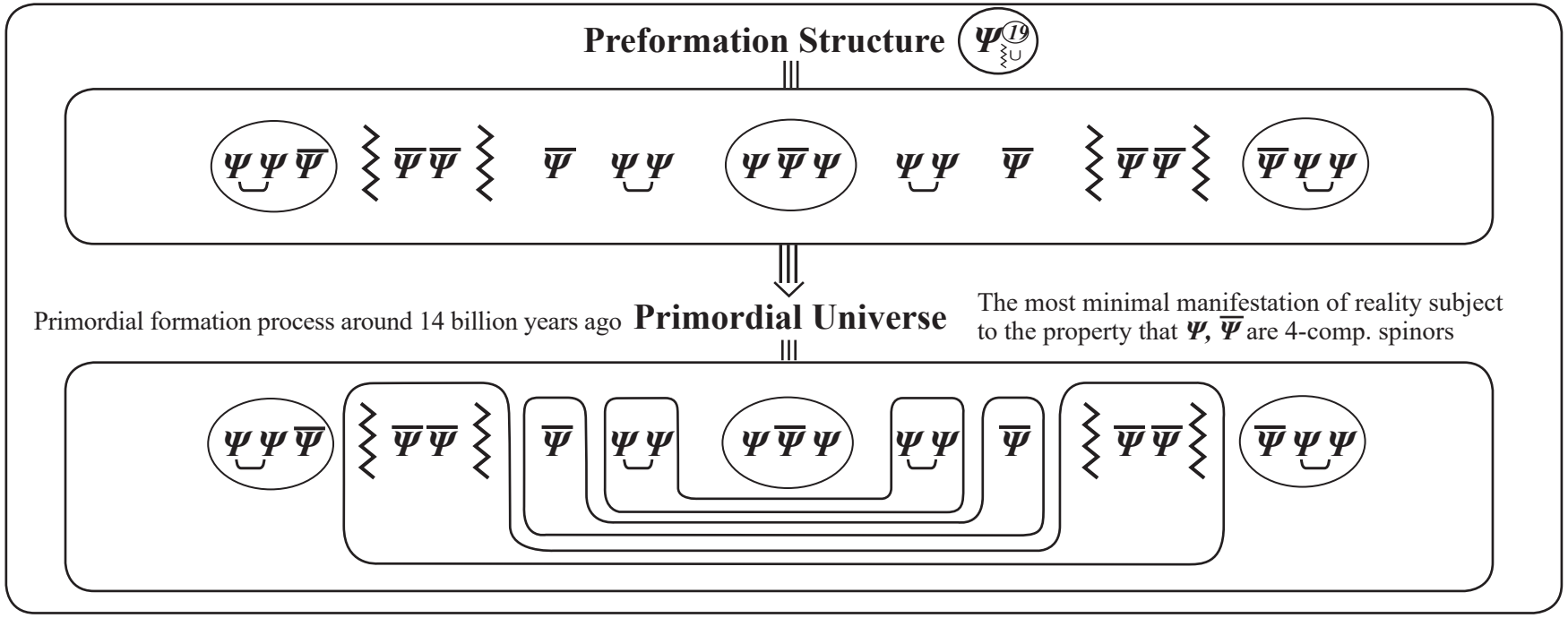
or in box form (see V.7.):

$$\left[D^{(13)}_{\sigma_{13}}\Psi(x)\right]_{\wr\cup} \equiv \Psi^{(19)}_{\wr\cup}(x,\sigma_{13}) \equiv \Psi^{(19)}_{\wr\cup}(x) \equiv \Psi\text{-}19 \equiv \text{V.7.}$$

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

This structured $\Psi^{(19)}_{U}$ is the inner preformation structure from which all reality must form. We could also call it the Pre-Universe, from which more than 13.8 billion years ago the first manifestation of the Universe developed – the Primordial Universe .Thus, at the very beginning of the creation and development processes of the Universe, the Primordial Universe was the most symmetric possible manifestation of reality, centred around the origin of interaction x in V.1., and was the first object to be created from the preformation structure V.1.. This Primordial Universe formed as follows:

V.3.



This primordial creation process unfolds in accordance with the property that (see I.2.1.), Ψ and $\overline{\Psi}$ are both spinors with 4 components, and therefore form the most highly symmetric possible Ψ and $\overline{\Psi}$-structures from the preformation structure V.1. – in accordance with the minimality principle I.0.3.. The rest forms as a result of the requirements associated with the global fermionic structure $\Psi^{(19)}_{U}$.

In this first creation act of the Primordial Universe, the following two 4-spinor formations were therefore created, where both Ψ and $\overline{\Psi}$ are 4-component spinors, in accordance with I.2.2.:

the $\Psi^{(4)} \equiv \Psi\ \Psi\ \Psi\ \Psi$-formation and the $\overline{\Psi}^{(4)} \equiv \overline{\Psi}\ \overline{\Psi}\ \overline{\Psi}\ \overline{\Psi}$-formation,

in the form of the

V.4.

$$\text{structuring foundation } \Psi^{(8)} \equiv \Psi^{(4)} + \overline{\Psi}^{(4)}.$$

which arises from the point split dynamic by IV.5. and is therefore systemically intrinsic.
This formation $\Psi^{(8)}$ originates from the point split, and therefore by IV.5.,
has the predetermined form of

$$\Psi^{(4)} \equiv \Psi\ \Psi\ \Psi\ \Psi \equiv \text{separation} \quad \text{and} \quad \overline{\Psi}^{(4)} \equiv \overline{\Psi}\ \overline{\Psi}\ \overline{\Psi}\ \overline{\Psi} \equiv \text{binding}.$$

This separation and binding action, and thus the associated separation and binding structure, is therefore fixed as a pre-established structure throughout all subsequent events.

V.5.

Because of this pre-established action and function of the structure foundation $\Psi^{(8)}$ (IV.5.) the following holds from the very beginning of all events that unfold within the Universe:

$\Psi\ \Psi\ \Psi\ \Psi$ -configurations have a separating effect ≡ repulsive

$\overline{\Psi}\ \overline{\Psi}\ \overline{\Psi}\ \overline{\Psi}$ -configurations have a binding effect ≡ attractive

Furthermore:

Each separation structure element ≀ in the preformation structure $\Psi^{(19)}$ (V.1.) is directly surrounded by 2 $\overline{\Psi}$-spinors, i.e. $\overline{\Psi}\wr\overline{\Psi}$.

Thus, in all subsequent events (all events in the Universe until today), the spinor configuration $\overline{\Psi}\,\overline{\Psi}$ is predetermined to be repulsive – we could also say that this is "pre-established" – following from the most fundamental structure act IV.5. that precedes all events in the Universe.

Also:

Each binding structure element ∪ in the preformation structure $\Psi^{(19)}$ (V.1.) is directly surrounded by 2 Ψ-spinors, i.e. $\Psi\,\Psi$.

Thus, in all subsequent events (all events in the Universe until today), the spinor configuration $\Psi\,\Psi$ is predetermined to be attractive – we could also say that this is "pre-established" – following from the most fundamental structure act IV.5. that precedes all events in the Universe.

These properties V.5., which are caused by the fundamental structuring into "separation" and "binding" (see IV.5.) and which therefore hold throughout the whole construction of the Universe and the whole history of the Universe from its very beginning, namely the following pre-established properties:

V.6.

$\Psi\ \Psi\ \Psi\ \Psi$ ≡ separation ≡ repulsion

$\overline{\Psi}\ \overline{\Psi}\ \overline{\Psi}\ \overline{\Psi}$ ≡ binding ≡ attraction

$\Psi\ \Psi$ ≡ binding ≡ attraction

$\overline{\Psi}\ \overline{\Psi}$ ≡ separation ≡ repulsion

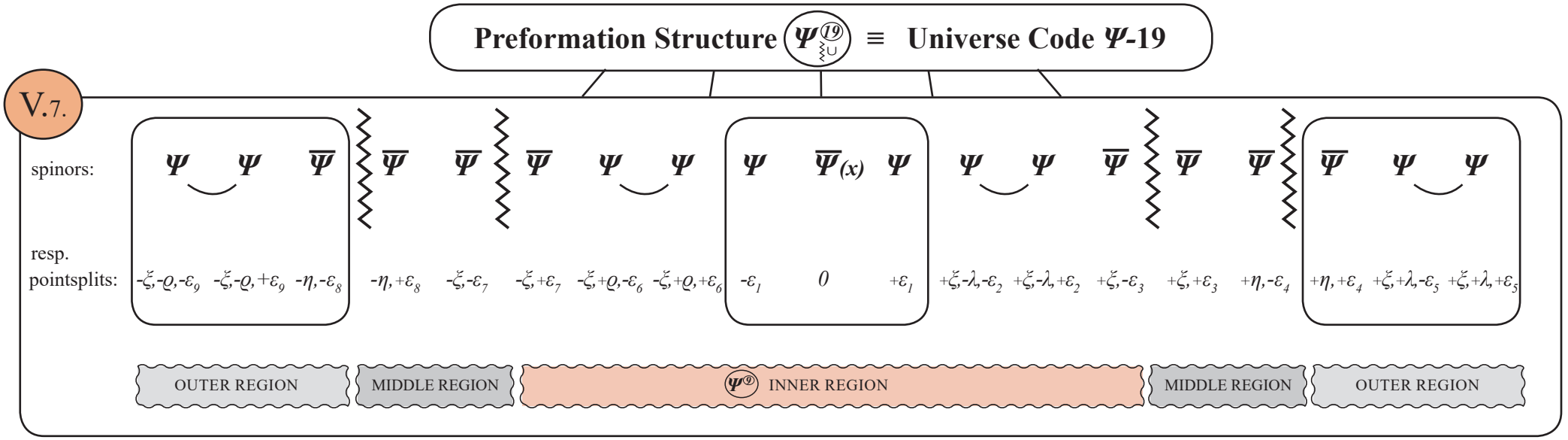
≡ fundamental force structure

also cause the boson force structure intrinsic to this first ever Primordial Universe to form at the beginning of all events in the Universe, namely in the first creation act of the Primordial Universe.
The structure of the Primordial Universe may therefore be described as follows:

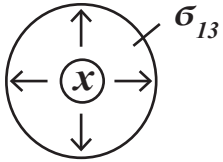
By V.3., the structure of the Primordial Universe is

from the preformation structure V.1. —there forms→ **first ever manifestation of reality**

together with the point split densities formed in the dynamic creation process:


Preformation Structure $\Psi^{(19)}_{\cup}$ ≡ Universe Code Ψ-19
V.7.
spinors:
resp.
pointsplits:
$\Psi\ \Psi\ \overline{\Psi}$
$\overline{\Psi}\ \overline{\Psi}$
$\overline{\Psi}\ \overline{\Psi}$
$\Psi\ \Psi$
$\Psi\ \overline{\Psi}_{(x)}\ \Psi$
$\Psi\ \Psi$
$\overline{\Psi}\ \overline{\Psi}$
$\overline{\Psi}\ \overline{\Psi}$
$\overline{\Psi}\ \Psi\ \Psi$
$-\xi,-\varrho,-\varepsilon_9$ $-\xi,-\varrho,+\varepsilon_9$ $-\eta,-\varepsilon_8$
$-\eta,+\varepsilon_8$
$-\xi,-\varepsilon_7$
$-\xi,+\varepsilon_7$
$-\xi,+\varrho,-\varepsilon_6$ $-\xi,+\varrho,+\varepsilon_6$
$-\varepsilon_1$ 0 $+\varepsilon_1$
$+\xi,-\lambda,-\varepsilon_2$ $+\xi,-\lambda,+\varepsilon_2$
$+\xi,-\varepsilon_3$
$+\xi,+\varepsilon_3$
$+\eta,-\varepsilon_4$
$+\eta,+\varepsilon_4$ $+\xi,+\lambda,-\varepsilon_5$ $+\xi,+\lambda,+\varepsilon_5$
OUTER REGION
MIDDLE REGION
$\Psi^{(9)}$ INNER REGION
MIDDLE REGION
OUTER REGION
Primordial Universe
V.8.
spinors:
$\Psi\Psi\overline{\Psi}$
$\overline{\Psi}\overline{\Psi}$
$\overline{\Psi}$
$\Psi\Psi$
$\Psi\overline{\Psi}\Psi$
$-\varepsilon_1$ 0 $+\varepsilon_1$
$\Psi\Psi$
$\overline{\Psi}$
$\overline{\Psi}\overline{\Psi}$
$\overline{\Psi}\Psi\Psi$

The Primordial Universe develops according to the construction process III.1. to III.4., from the inside outwards around the central origin of interactio x, via the formation of the dynamically generated point split σ_{13} (see III.4.), i.e. in the point split-separated neighbourhood x, σ_{13} dof the preformation structure $\Psi^{(19)}_{\cup}(x, \sigma_{13})$, namely:



V.9.

Initiated by the construction process, which unfolds from the inside outwards, the point split distribution during the first creation process of the Universe is arranged maximally inwards, i.e. concentrated on the inner region $\Psi^{(9)}$ in V.1., V.2. as much as possible.

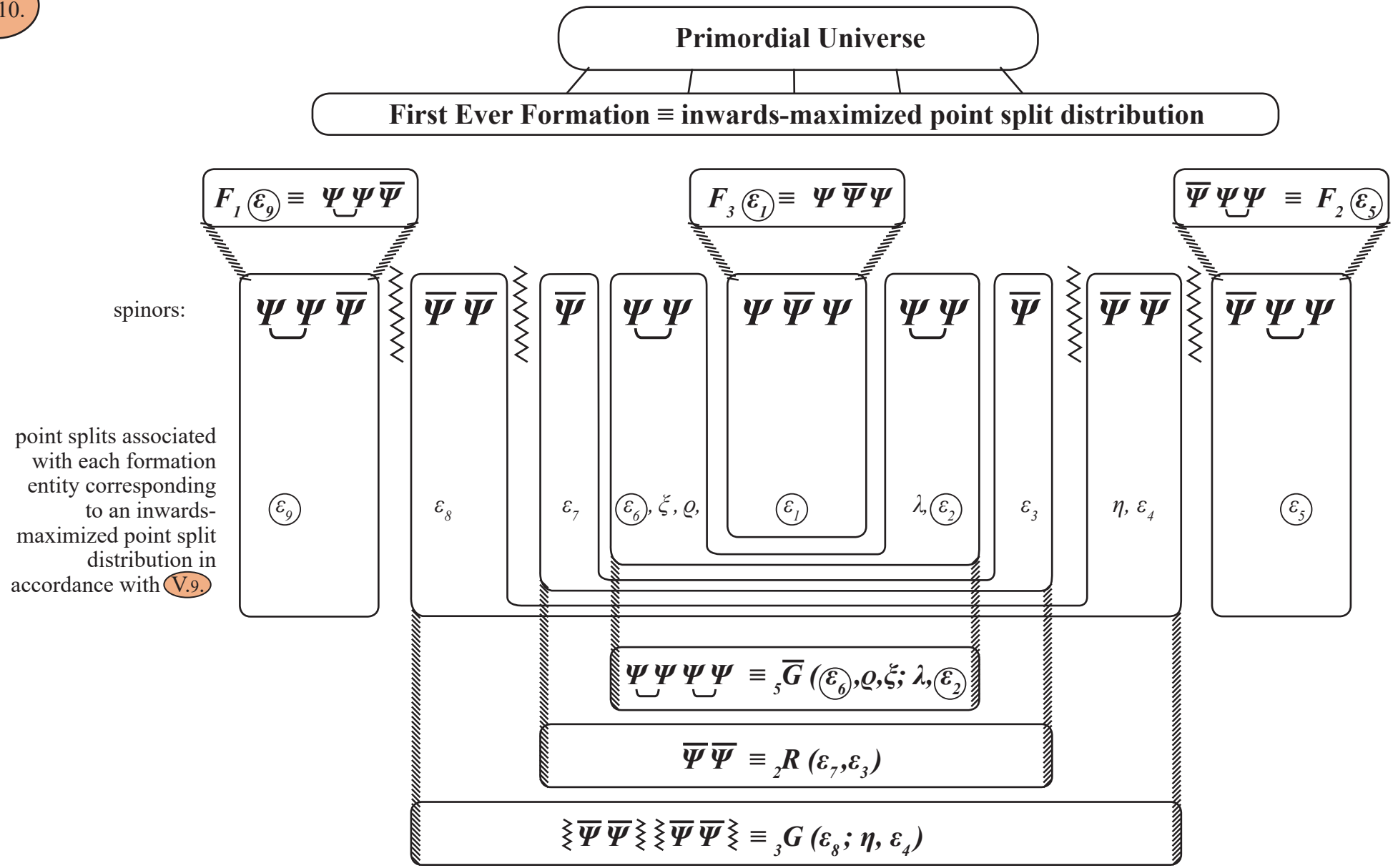
Thus: The middle region (≡ G) is only acted upon by point splits that exist outside of core region $\Psi^{(9)}$ in V.2. . Similarly, the outer region is only acted upon by point splits that exist outside of the middle region.

Whenever a point split σ^{ν}, ν= 1, ..., 13, is used to form a formation entity in V.8. by participating in the construction of the inner structure (the point split density) of this formation entity, it then becomes unavailable for the construction of other formation entities.

This means: In the creation process and the formation of the Primordial Universe, there is the following point split process sequence:

Maximization of the point split distribution, as much as possible, towards the inner region $\Psi^{(9)}$ in V.7.. Thus, the formation entities of the Primordial Universe V.8. have the point split distributions:

V.10.


Primordial Universe
First Ever Formation ≡ inwards-maximized point split distribution
$F_1(\varepsilon_9) \equiv \Psi\Psi\overline{\Psi}$
$F_3(\varepsilon_1) \equiv \Psi\overline{\Psi}\Psi$
$\overline{\Psi}\Psi\Psi \equiv F_2(\varepsilon_5)$
spinors:
point splits associated with each formation entity corresponding to an inwards-maximized point split distribution in accordance with V.9.
$\Psi\Psi\overline{\Psi}$
$\overline{\Psi}\,\overline{\Psi}$
$\overline{\Psi}$
$\Psi\Psi$
$\Psi\overline{\Psi}\Psi$
$\Psi\Psi$
$\overline{\Psi}$
$\overline{\Psi}\,\overline{\Psi}$
$\overline{\Psi}\Psi\Psi$
ε_9
ε_8
ε_7
$\varepsilon_6, \xi, \varrho,$
ε_1
λ, ε_2
ε_3
η, ε_4
ε_5
$\Psi\Psi\Psi\Psi \equiv {}_5\overline{G}(\varepsilon_6, \varrho, \xi; \lambda, \varepsilon_2)$
$\overline{\Psi}\,\overline{\Psi} \equiv {}_2R(\varepsilon_7, \varepsilon_3)$
$\overline{\Psi}\,\overline{\Psi}\,\overline{\Psi}\,\overline{\Psi} \equiv {}_3G(\varepsilon_8; \eta, \varepsilon_4)$

With

F_1, F_2	≡	**structurally determined by the preformation structure** V.7.
F_3	≡	**structurally determined by the minimality principle** I.2.1.
${}_5\overline{G}$	≡	**structurally determined by the identity principle** I.5.
${}_3G$	≡	**structurally determined by the identity principle** I.5.
${}_2R$	≡	**structurally determined by what remains**

the formation entities of the first ever formation, or in other words the individual fermion and boson entities of the Primordial Universe, are as follows, assuming an inwards-maximized point split distribution, thus determining the structure of the Primordial Universe, before the Big Bang, 13.8 billion years ago:

V.11.

Fermions:	$F_1(\varepsilon_9); F_2(\varepsilon_5); F_3(\varepsilon_1)$	≡ **all**	**1-point split object**
Bosons:	${}_5\overline{G}(\varepsilon_6, \varrho, \xi; \lambda, \varepsilon_2)$	≡	**5-point split object**
	${}_2R(\varepsilon_7, \varepsilon_3)$	≡	**2-point split object**
	${}_3G(\varepsilon_8; \eta, \varepsilon_4)$	≡	**3-point split object**

,

where the symbols of the bosons $\overline{G}$, R, G are chosen to reflect their most fundamental properties V.5.**:**

$\overline{G}$ ≡	$\Psi\ \Psi\ \Psi\ \Psi$	≡ **repulsive**	≡ **„anti-gravitation“**
R ≡	$\overline{\Psi}\ \overline{\Psi}$	≡ **repulsive**	≡ **„repulsion“**
G ≡	$\overline{\Psi}\ \overline{\Psi}\ \overline{\Psi}\ \overline{\Psi}$	≡ **attractive**	≡ **„gravitation“,**

with reference to our current concept of “gravitation”.

In the following paper **„UC-2“**, we will discuss what the individual matter and force manifestations of the primordial universe V.10. (before the Big Bang) are and why the Big Bang was triggered.