

Directional Cosmology of the Rotating Universe

L'Architech (Gabriel Breton-Breault)

Introduction

The Universe displays, at every observable scale, structures that bear the signature of a rotating fluid. Solar systems form within spiral disks, galaxies organize themselves into massive vortexes around attractor centers, cosmic filaments stretch and coil like giant arms, and superstructures reveal coherent currents extending across hundreds of millions of light-years.

These patterns are not isolated. They are not local accidents. They are not exceptions. They constitute a universal pattern: **the dynamics of vortexes**.

In a rotating fluid, vortexes appear spontaneously, organize themselves, stabilize, and form hierarchies. In a cosmic fluid, the observed structures seem to follow exactly the same laws.

This document proposes a cosmology based on a single principle:

Space-time behaves like a rotating fluid, and this rotation generates vortexes at all scales.

This simple hypothesis makes it possible to unify phenomena that, in traditional models, are treated separately:

- the shape of spiral galaxies,
- the coherence of solar systems,
- the structure of cosmic filaments,
- the fractal organization of superclusters,
- the possible existence of a cosmic axis,
- the accelerated expansion of the cosmos.

In this vision, vortexes are not secondary objects: they are the **fundamental structures of the Universe**.

A solar system becomes a local vortex. A galaxy becomes a massive vortex. A filament becomes an intergalactic vortex. And the Universe itself could be a cosmic vortex, possessing a global geometry, a rotation axis, and a physical center potentially inaccessible beyond our causal horizon.

This directional cosmology does not aim to replace existing models, but to explore a coherent, fluid, and geometric alternative in which rotation plays a central role in the organization of the cosmos.

It rests on a simple idea: **if the observed structures look like vortexes, it may be because the Universe is a vortex.**

Chapter 1 — The Fundamental Principle: The Universe in Rotation

(Private Document — Directional Cosmology)

The observable Universe reveals structures which, despite their diversity of scale, share a common characteristic: **they bear the signature of rotational motion.** From protoplanetary disks to spiral galaxies, from rotating clusters to cosmic filaments stretching like giant arms, everything seems to obey a coherent fluid dynamic.

This first chapter establishes the founding principle of directional cosmology:

Space-time behaves like a rotating fluid, and this rotation organizes the cosmos.

1.1 — Rotation as a Fundamental Dynamic

In traditional cosmological models, the Universe is described as a uniformly expanding space, without axis, without center, without global rotation. This view relies on mathematical assumptions (isotropy, homogeneity) rather than direct observation of cosmic structure.

Yet the structures we observe are not isotropic. They are not homogeneous. They are not static. They are **spiraled, filamentary, directional, coherent.**

These patterns are characteristic of a fluid subjected to rotation. In a rotating fluid:

- matter organizes into disks,
- currents stabilize into spirals,
- density zones structure themselves into vortexes,
- filaments emerge as flow lines,
- gradients naturally form hierarchies.

The hypothesis of a rotating fluid-like space-time explains these structures without resorting to independent mechanisms or ad hoc adjustments.

1.2 — The Cosmic Fluid

In this cosmology, space-time is not a simple geometric framework. It is treated as a **cosmic fluid**, endowed with dynamic properties:

- circulation,
- tension,
- coherence,
- rotation,
- the ability to generate vortexes.

This fluid is not a material substance: it is a dynamic description of geometry itself.

The rotation of this fluid imposes a privileged direction, a global axis, and a fractal organization of structures.

1.3 — Rotation as the Origin of Vortexes

In a rotating fluid, vortexes appear spontaneously. They are not anomalies: they are the natural form of organization.

This dynamic explains:

- protoplanetary disks,
- solar systems,
- spiral galaxies,
- rotating clusters,
- cosmic filaments,
- directional superstructures.

Each vortex is a local manifestation of the global rotation of the cosmic fluid.

1.4 — A Cosmology Unified by Rotation

The central hypothesis of this document is simple:

If the observed structures resemble vortexes, it may be because the Universe is a vortex.

This idea makes it possible to unify:

- the formation of solar systems,
- the structure of galaxies,
- the organization of filaments,
- the coherence of superclusters,
- the potential geometry of the Universe itself.

It opens the possibility of a **cosmic vortex**, a global axis, and a physical center potentially located beyond our causal horizon.

1.5 — Purpose of the Document

This document explores the consequences of this rotational hypothesis:

- how rotation organizes structures,
- how vortexes emerge at all scales,
- how a cosmic center could exist,
- which observable signatures could reveal this rotation,
- and how this vision integrates into a coherent cosmology.

The next chapter will present the nature of the cosmic fluid and the dynamics of global rotation.

Chapter 2 — Space-Time as a Rotating Fluid

Directional cosmology is based on a central idea: **space-time is not a static framework**, but a cosmic fluid capable of movement, tension, circulation, and above all, rotation. This chapter establishes the nature of this fluid, its properties, and how a global rotation can organize the entire cosmos.

2.1 — The Cosmic Fluid: A Dynamic Description of Space-Time

In this theory, space-time is treated as a continuous fluid. This fluid is not a material substance: it represents the internal dynamics of cosmic geometry.

It possesses properties analogous to those of a physical fluid:

- directional coherence,
- capacity for rotation,
- formation of currents,
- internal tension,
- propagation of waves,
- stability of vortexes.

This approach allows the Universe to be described not as an empty space, but as a **dynamic medium** where structures naturally emerge from rotation.

2.2 — The Global Rotation of the Cosmic Fluid

If space-time is a fluid, it can rotate. A global rotation imposes:

- a cosmic axis,
- a privileged direction,
- a fractal organization,
- structural coherence,
- a cosmic centrifugal force.

This rotation is not local: it affects the entire cosmic fluid, at the scale of the Universe.

In a rotating fluid, structures are not distributed randomly. They organize themselves into spiral patterns, filaments, disks, and vortexes.

These are precisely the structures we observe in the cosmos.

2.3 — The Cosmic Centrifugal Force

The rotation of the cosmic fluid produces a centrifugal force that acts on the geometry of space-time. This force:

- stretches the fluid,
- increases distances,
- accelerates expansion,
- favors the formation of spiral structures.

In this framework, the accelerated expansion of the Universe is not a mysterious phenomenon: it is a **natural consequence of global rotation**.

2.4 — Directional Coherence

A rotating fluid possesses an essential property: **directional coherence**.

This means that:

- currents follow rotational flow lines,
- structures align with the global axis,
- vortexes emerge spontaneously,
- filaments form like spiral arms,
- density zones stabilize around attractor centers.

This coherence is visible in:

- spiral galaxies,
- solar systems,
- cosmic filaments,
- superstructures.

It suggests that rotation is not a local phenomenon, but a **universal dynamic**.

2.5 — The Cosmic Fluid as the Origin of Vortexes

In a rotating fluid, vortexes appear naturally. They are not anomalies: they are the **stable form of organization**.

The cosmic fluid produces:

- local vortexes (solar systems),
- massive vortexes (galaxies),
- intergalactic vortexes (filaments),
- giant vortexes (superstructures),
- and potentially a **global cosmic vortex**.

This fractal hierarchy is a direct signature of the rotation of the cosmic fluid.

2.6 — A Dynamic Geometry

The rotation of the cosmic fluid imposes a dynamic geometry on the Universe:

- flattening,
- formation of disks,
- emergence of spirals,
- organization into filaments,
- possibility of a global toroidal structure.

In this framework, the geometry of the Universe is not imposed by an abstract mathematical model: it **emerges** from the dynamics of the cosmic fluid.

2.7 — Chapter Summary

This chapter establishes the foundation of directional cosmology:

Space-time is a rotating fluid. This rotation organizes the cosmos into vortexes at all scales.

The following chapters will show how this rotation produces:

- solar systems,
- galaxies,
- filaments,
- superstructures,
- and potentially a universal vortex.

Chapter 3 — Vortexes as Fundamental Structures of the Cosmos

In a rotating fluid, vortexes are not anomalies: they are the natural, stable, and self-organized form of the dynamic. This chapter establishes a central point of directional cosmology:

Vortexes are the fundamental building blocks of the Universe. They appear at all scales, following the same geometric logic.

This simple idea makes it possible to unify structures that, in traditional models, are treated as independent phenomena.

3.1 — Definition of a Cosmic Vortex

A vortex is a fluid structure organized around rotational motion. It possesses:

- an attractor center,
- a rotation axis,
- spiral circulation,
- a disk- or arm-like distribution,
- directional coherence,
- dynamic stability.

In a cosmic fluid, these characteristics emerge naturally whenever global rotation is present.

3.2 — Why Vortexes Appear in a Rotating Fluid

In a fluid subjected to rotation:

- particles follow flow lines,
- density zones concentrate around a center,
- gradients stabilize into spirals,
- structures flatten into disks,
- filaments emerge like spiral arms.

This dynamic is universal: it occurs in water, in air, in plasmas... and in the cosmic fluid.

Thus, vortexes are not exceptions: they are the natural response of the fluid to rotation.

3.3 — Vortexes as a Universal Pattern

Observations show that vortexes exist at all scales:

Local scale: solar systems

- protoplanetary disk,
- circular orbits,
- attractor center (star),
- spiral dynamics in gas clouds.

Galactic scale: spiral galaxies

- spiral arms,
- flattened disk,
- global rotation,
- central black hole.

Cosmic scale: filaments and superstructures

- elongated structures,
- spiral-like curvatures,
- directional coherence,
- fractal organization.

Universal scale: hypothesis of a cosmic vortex

- global axis,
- rotation of the cosmic fluid,
- possible toroidal geometry,
- potential physical center.

This fractal hierarchy is the signature of a rotating fluid.

3.4 — The Vortex as a Structural Unit

In this cosmology, a vortex is not a secondary phenomenon. It is the **fundamental structural unit** of the cosmos.

Each vortex:

- organizes matter,
- stabilizes currents,
- imposes geometry,
- creates density zones,
- generates filaments,
- fits within a larger vortex.

This hierarchy gives the cosmos a **self-similar, coherent, directional** structure.

3.5 — Universal Properties of Vortexes

Cosmic vortexes share common properties:

1. An attractor center

Star, black hole, density region, cosmic attractor.

2. A rotation axis

Local or global, depending on scale.

3. Spiral geometry

Arms, filaments, currents.

4. Disk or torus structure

Depending on density and rotation speed.

5. Directional coherence

Structures align with the vortex axis.

6. Dynamic stability

Vortexes persist for billions of years.

These properties are visible in solar systems, galaxies, filaments, and superstructures.

3.6 — The Vortex as a Signature of Cosmic Rotation

If vortexes appear everywhere, it is because rotation is everywhere. In this cosmology:

Vortexes are proof that the Universe is rotating.

They are not isolated phenomena: they are local manifestations of a global dynamic.

3.7 — Chapter Summary

This chapter establishes a fundamental point:

Vortexes are the primary structures of the Universe. They emerge naturally from the rotating cosmic fluid. They exist at all scales, following the same geometric logic.

The following chapters will show how this vortex dynamic organizes:

- solar systems (local vortexes),
- galaxies (massive vortexes),

- filaments (intergalactic vortices),
- and potentially the Universe itself (cosmic vortex).

Chapter 4 — Solar Systems: Local Vortices

Solar systems represent the first observable scale at which the vortex dynamics of the cosmic fluid become clearly identifiable. Although they are infinitely less massive than a galaxy, their structure, formation, and organization obey the same geometric laws: an attractor center, a rotating disk, spiral currents, and directional coherence. This chapter shows that solar systems are miniature vortices, local manifestations of the global rotation of the cosmic fluid.

4.1 — Formation of a Solar System: Birth of a Vortex

A solar system is born within a cloud of gas and dust. This cloud always possesses an initial rotation, even if extremely small. This rotation is amplified by gravitational collapse: the cloud contracts, the rotation speed increases, and the cloud flattens into a protoplanetary disk.

This process is identical to the formation of a vortex in a fluid:

- initial rotation,
- contraction,
- acceleration,
- flattening,
- spiral organization.

The protoplanetary disk is the direct signature of a forming vortex.

4.2 — The Sun: Attractor Center of the Vortex

At the heart of the disk, matter concentrates to form a star. The Sun then becomes:

- the attractor center,
- the directional pivot,
- the vortex axis,
- the source of coherence for the system.

In a rotating fluid, every vortex possesses a center. In a solar system, this center is the star.

4.3 — Planetary Orbits: Flow Lines of the Vortex

Planets follow the flow lines of the local cosmic vortex.

Their orbits:

- are circular or elliptical,
- lie within a plane (the ecliptic plane),
- respect a hierarchy of distances,
- obey directional coherence.

This organization is not merely gravitational: it is **vortex-based**.

Planets are particles caught in a cosmic whirlpool.

4.4 — The Protoplanetary Disk: Vortex Geometry

The protoplanetary disk is a flattened vortex:

- rapid rotation,
- density decreasing outward,
- internal dust spirals,
- velocity gradients,
- condensation zones.

This structure is identical to that of a fluid vortex:

- dense center,
- accelerated rotation,
- spiral matter distribution,
- natural flattening.

The solar system is therefore a miniature vortex, geometrically identical to a galaxy but on a much smaller scale.

4.5 — Comets and Asteroids: Traces of the Vortex

Comets, asteroids, and trans-Neptunian objects follow trajectories that reveal the deep structure of the vortex:

- inclined orbits,
- spiral trajectories,
- irregular density zones,
- directional alignments.

They are the “free particles” of the solar vortex, revealing the internal geometry of the local cosmic whirl.

4.6 — Scale Relation: Planetary Distances and Stellar Distances

A remarkable observation reinforces the idea that solar systems are fractal vortexes: the distribution of planetary distances around a star resembles, in its logic, the distribution of stellar distances around the galactic center.

4.6.1 — Logarithmic Progression of Planetary Distances

In a solar system:

- planetary distances follow a quasi-logarithmic progression,
- orbits stabilize at privileged zones,
- distances are not random.

Even though the Titius–Bode law is imperfect, it reveals a logarithmic structure typical of vortexes.

4.6.2 — Logarithmic Progression of Stellar Distances in a Galaxy

In a galaxy:

- stars distribute themselves along logarithmic curves,
- spiral arms follow vortex equations,
- distances from the galactic center obey stability zones.

4.6.3 — A Fractal Relationship

Both vortexes — solar and galactic — follow the same logic:

$$\text{orbital distance} \propto \text{logarithmic vortex structure}$$

This is not a coincidence. It is a **fractal signature**:

Solar systems are miniature vortexes. Galaxies are giant vortexes. Orbital distances follow the same geometric logic.

This scale relation is indirect evidence that vortex dynamics are universal.

4.7 — Why Solar Systems Are Less Dense Than Galaxies

The directional density of a vortex depends on:

- the central mass,
- the rotation speed,
- the coherence of the cosmic fluid,
- the scale of the vortex.

A galaxy possesses:

- a supermassive black hole,
- billions of stars,
- rapid rotation,
- high directional density.

A solar system possesses:

- a single star,
- a few planets,
- slow rotation,
- low directional density.

The dynamic is the same, but the scale changes.

4.8 — The Solar System as a Fractal Vortex

The solar system is a fractal vortex:

- same geometry as a galaxy,
- same rotational laws,
- same organization around an attractor center,
- same disk structure,

- same spirals,
- same stability zones.

It is simply a miniature vortex, embedded within a larger vortex (the galaxy), itself embedded within an even larger vortex (cosmic filaments).

4.9 — Chapter Summary

This chapter establishes that:

Solar systems are local vortexes of the cosmic fluid. Their structure, formation, and orbital distances obey the same laws as galactic vortexes, but at a reduced scale.

They constitute the first fractal proof that rotation is a universal dynamic.

Chapter 5 — Galaxies: Massive Vortexes

Galaxies represent the intermediate scale at which the vortex dynamics of the cosmic fluid become spectacular. At this scale, rotation is no longer just a local phenomenon: it structures billions of stars, organizes spiral arms, stabilizes giant disks, and reveals the presence of an attractor center of extreme power. This chapter shows that galaxies are massive vortexes, directional structures whose geometry, dynamics, and coherence can only be explained by the rotation of the cosmic fluid.

5.1 — The Spiral Galaxy: Archetype of the Cosmic Vortex

Spiral galaxies are the most emblematic structures of the cosmos. They possess:

- an attractor center (often a supermassive black hole),
- a flattened disk,
- spiral arms,
- global rotation,
- directional coherence across tens of thousands of light-years.

These characteristics are identical to those of a fluid vortex:

- dense center,
- accelerated rotation,
- logarithmic spirals,

- density gradients,
- dynamic stability.

The spiral galaxy is therefore a massive vortex, structured by the rotation of the cosmic fluid.

5.2 — The Supermassive Black Hole: Heart of the Galactic Vortex

At the center of most spiral galaxies lies a supermassive black hole. This black hole is not merely a gravitational object: it is the **attractor center of the galactic vortex**.

It imposes:

- a rotation axis,
- directional coherence,
- internal tension within the cosmic fluid,
- organization of the spiral arms.

In a rotating fluid, every vortex possesses a center. In a galaxy, this center is a supermassive black hole.

5.3 — Spiral Arms: Flow Lines of the Vortex

Spiral arms are not static structures. They are **flow lines** of the galactic vortex.

They follow logarithmic curves typical of fluid vortexes:

$$r(\theta) = r_0 e^{k\theta}$$

This equation is identical to the spirals observed in whirlpools, cyclones, and hydrodynamic vortexes.

Spiral arms are therefore direct manifestations of the rotation of the cosmic fluid.

5.4 — The Galactic Disk: Vortex Geometry

The galactic disk is a flattened vortex:

- rapid rotation,
- density decreasing outward,
- velocity gradients,
- condensation zones,

- directional coherence.

This structure is identical to that of a protoplanetary disk, but on a gigantic scale.

The solar system is a miniature vortex. The galaxy is a massive vortex. The logic is the same.

5.5 — Scale Relation: Stellar Distances and Planetary Distances

As in solar systems, the distances of stars within a galaxy follow a **logarithmic progression**.

Stars stabilize within privileged zones of the galactic vortex:

- inner regions: rapid rotation, high density,
- outer regions: slower rotation, lower density,
- spiral arms: zones of dynamic stability.

This progression is fractal:

The distances of stars in a galaxy obey the same logic as the distances of planets in a solar system.

It is a direct signature of vortex dynamics.

5.6 — Elliptical and Irregular Galaxies: Disturbed Vortexes

Even non-spiral galaxies reveal vortex dynamics:

Elliptical galaxies

- stabilized vortex without spiral arms,
- diffuse internal rotation,
- spheroidal structure.

Irregular galaxies

- vortex disturbed by interactions,
- chaotic rotation,
- absence of defined arms.

Vortex dynamics are always present, even when geometry is altered.

5.7 — Galaxies as Fractal Vortexes

Galaxies are fractal vortexes:

- they possess the same geometry as solar systems,
- they obey the same rotational laws,
- they organize around an attractor center,
- they form logarithmic spirals,
- they stabilize stellar orbits.

They are simply **giant vortexes**, embedded within even larger vortexes (cosmic filaments).

5.8 — Chapter Summary

This chapter establishes that:

Galaxies are massive vortexes of the cosmic fluid. Their structure, rotation, spiral arms, and stellar distances obey the same laws as solar vortexes, but at a gigantic scale.

They constitute intermediate proof that rotation is a universal dynamic present at all scales of the cosmos.

Chapter 6 — Cosmic Filaments: Intergalactic Vortexes

At the largest scale we can observe, the Universe reveals an astonishing structure: a gigantic network of filaments, walls, voids, and superclusters. This “cosmic web” is not a random arrangement of galaxies. It possesses directional coherence, subtle spiral organization, and dynamic currents reminiscent of the internal structure of a vortex. This chapter shows that cosmic filaments are **intergalactic vortexes**, fluid structures that extend the rotational dynamics observed in solar systems and galaxies.

6.1 — The Cosmic Web: A Directional Network

Large-scale observations show that the Universe is not homogeneous. It is structured into:

- **filaments** (chains of galaxies),
- **walls** (planar superstructures),
- **nodes** (superclusters),
- **voids** (low-density regions).

These structures extend across hundreds of millions of light-years. They are not distributed randomly: they follow the **flow lines of the cosmic fluid**.

Filaments are the “arms” of the cosmic structure, exactly like the spiral arms of a galaxy, but on a gigantic scale.

6.2 — Filaments as Large-Scale Spiral Arms

Cosmic filaments display characteristics typical of vortices:

- spiral-like curvatures,
- directional alignments,
- density gradients,
- condensation zones,
- coherence across immense distances.

They resemble spiral arms, but instead of carrying stars, they carry **entire galaxies**.

This spiral geometry is a direct signature of the rotation of the cosmic fluid at large scale.

6.3 — Superclusters: Regional Attractor Centers

Galaxy superclusters act as **regional attractor centers** within intergalactic vortices.

They impose:

- directional tension,
- circulation of the cosmic fluid,
- organization of filaments,
- dynamic coherence.

Each supercluster is a “mini-center” of the cosmic vortex, just as a star is the center of a solar vortex, or a black hole is the center of a galactic vortex.

6.4 — Cosmic Voids: Low-Density Zones of the Vortex

Voids are not “structureless” regions. They are the **low-density zones** of the cosmic vortex.

In a rotating fluid:

- high-density zones concentrate in the arms,
- low-density zones form between the arms.

Cosmic voids are therefore the internal regions of the vortex where directional density is minimal.

They reveal the deep geometry of the cosmic whirl.

6.5 — Scale Relation: Solar Vortex → Galactic Vortex → Cosmic Vortex

Cosmic filaments extend the fractal hierarchy of vortices:

Local vortex: solar system

- center: star
- orbits: planets
- structure: disk + spiral

Massive vortex: galaxy

- center: supermassive black hole
- orbits: stars
- structure: disk + spiral arms

Intergalactic vortex: cosmic filaments

- center: supercluster
- orbits: galaxies
- structure: filaments + directional currents

The logic is identical. Only the scale changes.

This fractality is proof that the rotation of the cosmic fluid is universal.

6.6 — Filaments as Evidence of Global Rotation

Filaments cannot be explained by isotropic expansion. They require:

- a privileged direction,
- internal tension of the cosmic fluid,
- coherent circulation,
- spiral dynamics.

These characteristics are incompatible with a strictly homogeneous and isotropic Universe.

They are perfectly compatible with:

a rotating cosmic fluid organizing structures at all scales.

Filaments are therefore indirect evidence of the global rotation of the Universe.

6.7 — Filaments as Precursors of the Universal Vortex

Filaments are the “arms” of the cosmic vortex. They indicate that the Universe may possess:

- a global axis,
- cosmic rotation,
- toroidal geometry,
- a physical center (potentially beyond our causal horizon).

They are the first visible manifestations of the structure of the universal vortex.

6.8 — Chapter Summary

This chapter establishes that:

Cosmic filaments are intergalactic vortexes. Their structure, geometry, and coherence extend the vortex dynamics observed in solar systems and galaxies. They constitute fractal proof that the rotation of the cosmic fluid organizes the Universe at all scales.

Filaments are the arms of the cosmic vortex, revealing the deep structure of the Universe.

Chapter 7 — Hypothesis of a Universal Vortex

The previous chapters established a clear hierarchy: solar systems are local vortexes, galaxies are massive vortexes, cosmic filaments are intergalactic vortexes.

At every scale, the same dynamic appears: an attractor center, rotation, spiral geometry, directional coherence.

This chapter takes the next logical step:

If the structures observed at all scales are vortexes, then the Universe itself could be a cosmic vortex.

This hypothesis is not speculative: it follows directly from the fractality of structures and the rotational dynamics of the cosmic fluid.

7.1 — The Principle of Fractal Continuity

In a rotating fluid, vortexes appear at all scales. They are not isolated: they interlock, form hierarchies, and extend across scales.

The fractality observed in the cosmos suggests a continuity:

- solar vortex → local scale
- galactic vortex → regional scale
- filament vortex → cosmic scale
- universal vortex → global scale

This continuity is natural in a rotating fluid. It is incompatible with a strictly isotropic and homogeneous Universe.

7.2 — The Universe as a Rotating Fluid

If space-time is a fluid, it can rotate. A global rotation imposes:

- a cosmic axis,
- a privileged direction,
- fractal organization,
- spiral geometry,
- internal tension,
- a cosmic centrifugal force.

This rotation is not a local phenomenon: it affects the entire cosmic fluid.

The structures we observe — spirals, filaments, superclusters — are local manifestations of this global rotation.

7.3 — Geometry of a Universal Vortex

A cosmic vortex would possess a global geometry:

1. A physical center

A cosmic attractor, potentially a massive object or a region of extreme density.

2. A rotation axis

A privileged direction, indirectly visible in certain cosmological anisotropies.

3. A toroidal structure

A rotating fluid naturally tends toward a torus geometry:

- hollow or dense center,
- peripheral circulation,
- large-scale spiral arms.

4. Cosmological arms

Filaments would be the arms of the universal vortex.

5. Centrifugal expansion

Accelerated expansion could be a consequence of global rotation.

This geometry is not imposed by an abstract mathematical model: it **emerges** from the dynamics of the cosmic fluid.

7.4 — The Cosmic Center: Attractor of the Universal Vortex

In a vortex, there is always a center. This center could be:

- a cosmic black hole,
- a region of extreme density,
- a directional attractor,
- a geometric pivot.

This center is not necessarily observable. It could lie **beyond our causal horizon**, which does not invalidate its existence.

The correct formulation is:

If the Universe has a physical center, and if the distance between our position and this center exceeds our causal horizon, then this center is currently inaccessible to direct observation.

This condition is coherent, clean, and compatible with directional cosmology.

7.5 — Signatures of a Universal Vortex

Even if the center is invisible, a cosmic vortex would leave measurable signatures:

1. Directional anisotropy

Certain observations of the cosmic microwave background show a privileged axis (Axis of Evil).

2. Large-scale spiral structures

Cosmic filaments follow curves reminiscent of spiral arms.

3. Supercluster coherence

Superclusters align along privileged directions.

4. Non-perfectly isotropic expansion

Regional variations in expansion could be interpreted as centrifugal effects.

5. Structural fractality

The repetition of vortexes at all scales is a direct signature of global rotation.

These clues do not prove a universal vortex, but they make it plausible.

7.6 — Why This Hypothesis Is Coherent

The hypothesis of a universal vortex:

- unifies structures at all scales,
- explains the fractality of the cosmos,
- gives meaning to directional coherence,
- proposes a dynamic origin for accelerated expansion,
- integrates naturally into a fluid model,
- does not contradict current observations,
- opens the way to testable signatures.

It is simple, elegant, and geometrically natural.

7.7 — Chapter Summary

This chapter establishes that:

The Universe could be a cosmic vortex. Solar systems, galaxies, and filaments would be nested vortexes, local manifestations of a global rotation of the cosmic fluid. A physical center could exist, even if it lies beyond our causal horizon.

This hypothesis is the logical conclusion of the fractality of vortexes observed throughout the cosmos.

Chapter 8 — The Cosmic Center: Directional Attractor

If solar systems, galaxies, and cosmic filaments are nested vortexes, then fractal logic imposes a natural conclusion: **the universal vortex must possess a directional center**, a cosmic attractor around which the space-time fluid organizes itself. This chapter explores the nature of this center, its function, its geometry, and the reasons why it could be physically real while remaining invisible from our position in the Universe.

8.1 — In a Vortex, the Center Is Mandatory

In all known vortexes — hydrodynamic, atmospheric, plasma-based, astrophysical — there is always a center:

- cyclone → eye
- whirlpool → core
- galaxy → supermassive black hole
- solar system → star
- filament → supercluster

This structure is universal:

a vortex without a center does not exist.

If the Universe is a cosmic vortex, then it must possess a directional center.

This center is not an arbitrary hypothesis: it is a geometric consequence of the rotation of the cosmic fluid.

8.2 — Possible Nature of the Cosmic Center

The center of the universal vortex could be:

1. A cosmic black hole

An object larger in scale than galactic black holes, capable of stabilizing the rotation of the cosmic fluid.

2. A region of extreme density

A directional core where the density of the cosmic fluid reaches a maximum.

3. A geometric attractor

A point where the geometry of space-time folds or closes, imposing directional coherence on the entire cosmos.

4. A topological pivot

A non-material center, geometrically necessary to maintain the toroidal structure of the universal vortex.

These possibilities are not mutually exclusive. They describe different ways of interpreting the same phenomenon: **an attractor center imposing global rotation.**

8.3 — The Cosmic Center and Toroidal Geometry

A rotating fluid naturally tends toward a **toroidal geometry**:

- peripheral circulation,
- hollow or dense center,
- spiral arms,
- internal tension,
- dynamic stability.

If the Universe possesses a toroidal geometry, then the cosmic center is:

- either a dense region at the core of the torus,
- or a hollow region around which the fluid circulates.

In both cases, rotation imposes a **directional pivot**.

8.4 — Why the Cosmic Center Is Invisible

The cosmic center could be physically real while remaining invisible from our position. The correct formulation is:

If the Universe has a physical center, and if the distance between our position and this center exceeds our causal horizon, then this center is currently inaccessible to direct observation.

This is not an automatic consequence of the cosmological horizon. It is a **geometric condition** specific to a rotating Universe.

We do not see the center not because it does not exist, but because:

- light has not had time to reach us,
- expansion pushes central regions away faster than light can travel,
- our observable horizon is centered on us, not on the cosmic center.

8.5 — The Cosmic Center Leaves Observable Signatures

Even invisible, a cosmic center would leave traces in our observable region:

1. A cosmic axis

Certain anisotropies in the cosmic microwave background suggest a privileged direction.

2. Filament coherence

Filaments align like large-scale spiral arms.

3. Fractal distribution of structures

Vortexes appear at all scales, indicating global rotation.

4. Centrifugal expansion

Accelerated expansion could be an effect of the rotation of the cosmic fluid.

5. Directional tension

Superclusters seem to organize along coherent currents.

These signatures do not prove the existence of the cosmic center, but they are compatible with it.

8.6 — The Cosmic Center as the Origin of Universal Coherence

The center of the universal vortex plays a fundamental role:

- it imposes a privileged direction,
- it stabilizes the rotation of the cosmic fluid,
- it organizes fractal structures,
- it generates cosmological arms (filaments),
- it gives coherence to the entire cosmos.

Without a center, global rotation would be unstable. With a center, it becomes **self-organized, coherent, fractally hierarchical**.

8.7 — Chapter Summary

This chapter establishes that:

The universal vortex must possess a cosmic center. This center may be a directional attractor, a cosmic black hole, or a geometric pivot imposing global rotation of the cosmic fluid. It may be real while lying beyond our causal horizon. Its effects are visible in the fractal and directional structures of the cosmos.

The cosmic center is the keystone of rotational cosmology.

Chapter 9 — Causal Horizon and Inaccessibility of the Cosmic Center

If the Universe is a cosmic vortex, it possesses a directional center. But this center is not observable — not because it does not exist, but because **our position within the vortex and the physical limits of light** prevent us from accessing it.

This chapter clarifies a fundamental point:

The causal horizon defines what we can see, not what exists. A cosmic center can be real while lying outside our observable horizon.

9.1 — The Causal Horizon: A Physical Limit, Not a Cosmological One

The causal horizon is defined by a simple constraint:

- light travels at a finite speed,
- the Universe has a finite age,
- therefore we can only see what has had time for its light to reach us.

This limit is centered on **us**, not on the cosmic center. It defines **our observable Universe**, not the real Universe.

Thus:

The causal horizon says nothing about the presence or absence of a cosmic center. It only says we cannot see it if its light has not yet reached us.

9.2 — Our Horizon Is Not Centered on the Cosmic Center

In directional cosmology, our position O in the universal vortex is not at the center C .

Thus:

$$O \neq C$$

And it is possible that:

$$d(O, C) > R_{\text{observable}}$$

Meaning:

- the distance between us and the cosmic center exceeds the size of our causal horizon,
- therefore the center is invisible,
- but it may still exist physically.

This formulation is correct, clean, and compatible with physics.

9.3 — Rigorous Formulation of the Center's Inaccessibility

The correct statement is:

If the Universe possesses a physical center, and if the distance between our position and this center exceeds our causal horizon, then this center is currently inaccessible to direct observation.

This formulation is conditional, logical, and scientifically sound.

It does not claim that the horizon “hides” the center. It states that **rotational geometry can place the center beyond our causal reach.**

9.4 — Why the Cosmic Center Is Probably Beyond Our Horizon

Several reasons make this situation plausible:

1. Accelerated expansion pushes central regions away faster than light

If the center is sufficiently distant, it recedes faster than light can travel.

2. Light from the center has not had time to arrive

If the center is very old or very distant, its signal has not yet reached our region.

3. Our observable horizon is centered on us, not on the center

We see a sphere around **our position**, not around the cosmic center.

4. Global rotation can create distinct causal zones

In a vortex, some regions are naturally isolated by fluid dynamics.

These reasons do not prove the center is beyond the horizon, but they make the possibility coherent.

9.5 — Invisibility Does Not Imply Non-Existence

The fact that we do not see the cosmic center does not mean it does not exist.

A common error in isotropic models is to confuse **unobservable** with **nonexistent**.

In a rotating Universe:

- the center can be real,
- the center can be massive,
- the center can be directional,
- the center can organize structures,
- while still lying beyond our causal horizon.

Invisibility is a geometric consequence, not proof of absence.

9.6 — The Cosmic Center Leaves Signatures Within Our Horizon

Even invisible, the cosmic center can leave traces in our observable region:

1. A privileged axis in the cosmic microwave background

Certain anisotropies (Axis of Evil) suggest a global direction.

2. Directional coherence of filaments

Filaments align like large-scale spiral arms.

3. Fractality of vortices

Vortices appear at all scales, indicating global rotation.

4. Centrifugal expansion

Accelerated expansion can be interpreted as an effect of rotation.

5. Non-perfectly isotropic distribution of superclusters

Superstructures seem to follow coherent currents.

These signatures do not prove the cosmic center, but they are compatible with its existence.

9.7 — Chapter Summary

This chapter establishes that:

The causal horizon defines what we can see, not what exists. A cosmic center can be real while lying beyond our observable horizon. Its presence can leave signatures in our region even if its direct signal is inaccessible.

The inaccessibility of the cosmic center is a natural consequence of a rotating Universe.

Chapter 10 — Observable Signatures of a Rotating Universe

If the Universe is a cosmic vortex, this global rotation must leave traces within our observable region. Even if the cosmic center lies beyond our causal horizon, the rotational dynamics of the cosmic fluid influence the geometry, distribution, and motion of the structures we can measure.

This chapter identifies the observable signatures that could reveal the rotation of the Universe, and shows that several of them already appear in current cosmological data.

10.1 — Principle: A Global Rotation Produces Local Effects

In a rotating fluid:

- currents align,
- structures spiral,
- densities become fractal,
- gradients stabilize,
- privileged directions emerge.

These effects appear at all scales, even if the vortex center is inaccessible.

Thus:

A rotating Universe must leave measurable signatures within the observable cosmos.

This chapter catalogs them.

10.2 — Signature 1: Directional Anisotropies in the Cosmic Microwave Background

The cosmic microwave background (CMB) is expected to be isotropic. Yet several directional anomalies have been detected:

- **Axis of Evil** — abnormal alignment of CMB multipoles.

- **Cosmic dipole** — directional asymmetry not fully explained by our motion.
- **Weak quadrupole** — suppressed amplitude in certain directions.

These anomalies suggest:

- a privileged direction,
- global coherence,
- a structure not perfectly isotropic.

In directional cosmology, these anomalies are interpreted as:

traces of the rotation axis of the universal vortex.

10.3 — Signature 2: Alignment of Cosmic Filaments

Cosmic filaments are not randomly distributed. They exhibit:

- large-scale alignments,
- spiral-like curvatures,
- privileged directions,
- coherent connections between superclusters.

This organization resembles the arms of a giant vortex.

In a rotating Universe:

- filaments are the arms of the cosmic vortex,
- their alignment is a consequence of the rotation of the cosmic fluid.

10.4 — Signature 3: Fractality of Structures

Cosmic structures are fractal:

- solar systems → local vortexes
- galaxies → massive vortexes
- filaments → intergalactic vortexes
- superclusters → regional centers
- Universe → global vortex

This fractality cannot be explained by isotropic expansion. It is typical of a rotating fluid.

In a vortex:

- structures repeat at all scales,
- geometry is self-similar,
- distances follow logarithmic progressions.

Thus cosmic fractality is a **direct signature of universal rotation**.

10.5 — Signature 4: Non-Isotropic Distribution of Superclusters

Superclusters are not uniformly distributed. They appear to follow:

- directional currents,
- privileged density zones,
- coherent alignments.

This organization is incompatible with a strictly homogeneous Universe. It is compatible with:

a rotating cosmic fluid, where superclusters act as regional attractor centers.

10.6 — Signature 5: Centrifugal Expansion

The accelerated expansion of the Universe is usually attributed to mysterious dark energy. In directional cosmology, it can be interpreted differently:

Accelerated expansion is a centrifugal effect of the universal vortex.

In a rotating fluid:

- peripheral regions move away faster,
- expansion speed increases with distance,
- internal zones are more stable.

This dynamic qualitatively reproduces observations:

- accelerated expansion,
- distance-dependent velocity,
- global coherence.

Recent simulations of rotating universes also show measurable anisotropies between polar and equatorial expansion rates, supporting the plausibility of rotation as a cosmological factor.

10.7 — Signature 6: Galaxy Rotation Not Explained by Visible Matter

Galaxies rotate too quickly for the amount of visible matter they contain. Traditional models require:

- dark matter,
- invisible halos,
- dynamic adjustments.

In directional cosmology:

galactic rotation is inherited from the rotation of the cosmic fluid.

Dark matter becomes an emergent consequence of vortex dynamics, not a hypothetical substance.

10.8 — Signature 7: Alignment of Galaxy Rotation Axes

Studies show that:

- rotation axes of certain galaxies are aligned,
- orientations are not random,
- coherences appear across hundreds of millions of light-years.

In an isotropic Universe, this should not occur. In a rotating Universe:

galaxies naturally align with the axis of the cosmic vortex.

10.9 — Chapter Summary

This chapter establishes that:

A rotating Universe leaves observable signatures within our causal horizon. Many of these signatures already appear in cosmological data: CMB anisotropies, filament alignment, fractal structures, centrifugal expansion, galactic rotation, and directional coherence.

These clues do not prove global rotation, but they make it plausible, coherent, and testable.

Conclusion — Directional Cosmology and the Universal Vortex

This document establishes a coherent, fluid, and fractal vision of the Universe: a cosmology in which rotation is not a secondary phenomenon, but the **fundamental dynamic** that organizes all structures, from the scale of solar systems to that of the entire cosmos.

Solar systems, galaxies, filaments, and superclusters are not independent objects. They are **local manifestations of a rotating cosmic fluid**, each one a vortex embedded within a larger vortex. This fractal hierarchy is the signature of a universal dynamic.

Summary of Key Points

1. Space-time behaves like a rotating fluid.

This rotation imposes directional coherence and generates vortexes at all scales.

2. Vortexes are the fundamental structures of the cosmos.

They appear naturally in a rotating fluid and organize matter into disks, spirals, and filaments.

3. Solar systems are local vortexes.

Their geometry, orbital distances, and coherence reproduce vortex dynamics at small scale.

4. Galaxies are massive vortexes.

Their spiral arms, rotation, and attractor centers reveal a fluid structure identical to solar vortexes, but amplified.

5. Cosmic filaments are intergalactic vortexes.

They extend spiral dynamics across hundreds of millions of light-years.

6. The Universe itself may be a cosmic vortex.

The fractality of structures, the cosmic axis, centrifugal expansion, and CMB anisotropies make this hypothesis plausible.

7. A cosmic center may exist even if it lies beyond our causal horizon.

Inaccessibility is not evidence of absence: it is a geometric consequence of our position within the vortex.

8. Observable signatures support global rotation.

Alignments, fractality, anisotropies, directional coherence, and accelerated expansion are compatible with a rotating cosmic fluid.

General Conclusion

If the structures we observe resemble vortexes, it may be because the Universe is a vortex.

This directional cosmology proposes a unified, simple, and geometrically natural vision of the cosmos. It does not rely on hypothetical particles, invisible fields, or arbitrary adjustments. It rests on a universal fluid dynamic: **rotation**.

In this vision, the Universe is not a static space in expansion. It is a **cosmic whirl**, a rotating fluid whose fractal structures reveal its deep geometry.

Solar systems, galaxies, and filaments are not exceptions: they are the **imprints of the universal vortex**, the visible traces of a dynamic that extends beyond our causal horizon.