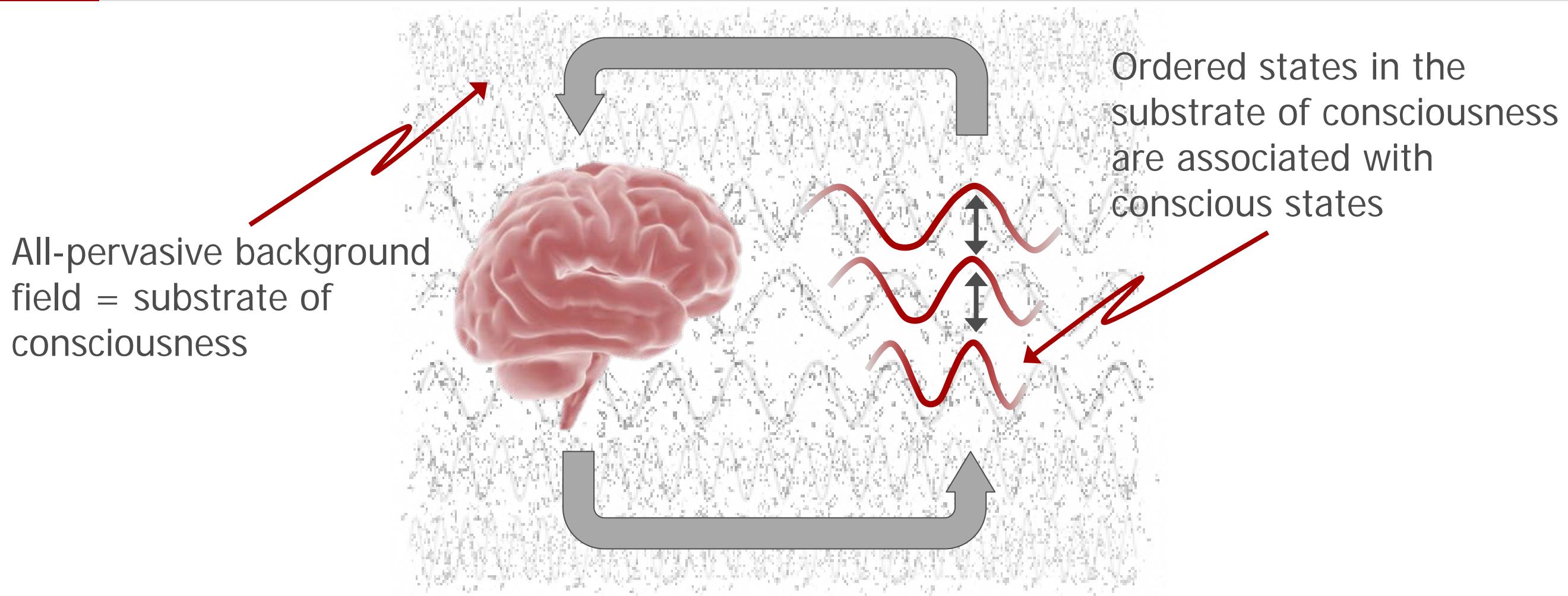# The Agent behind the Scenes

Exposing the Universal Mechanism Underlying Conscious Systems

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▶ Related publications:

▸▸ "A new perspective on the functioning of the brain and the mechanisms behind conscious processes"
Frontiers in Psychology 4:242. doi: 10.3389/fpsyg.2013.00242 (April 2013)

▸▸ "A Conceptual Framework for Consciousness Based on a Deep Understanding of Matter"
Philosophy Study 2, 689-703 (October 2012)

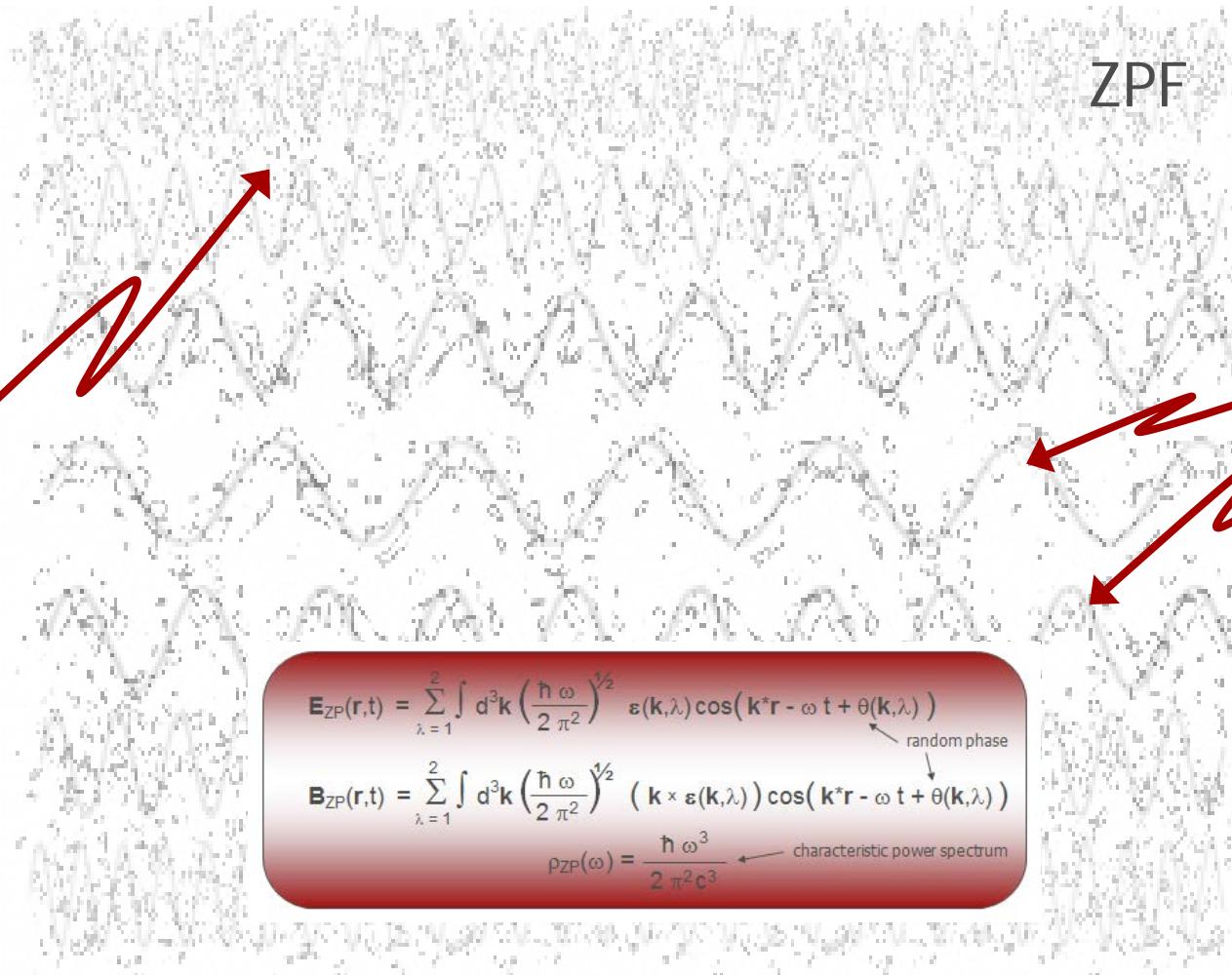# Central hypothesis: the brain is a highly specialized filter of consciousness

All-pervasive background field = substrate of consciousness

Ordered states in the substrate of consciousness are associated with conscious states

▸ The universe is imbued with a ubiquitous background field of consciousness that comprises the full phenomenal color palette.

▸ Conscious systems employ a universal mechanism by means of which they extract phenomenal nuances from this field.

▸ The key characteristic of the mechanism is the formation of ordered states in the substrate of consciousness.

ZPF — Frequency components are entirely uncorrelated among each other (inherently disordered)

Full spectrum of frequency components (inherently complete)

$$E_{ZP}(r,t) = \sum_{\lambda=1}^{2} \int d^3k \left(\frac{\hbar \omega}{2\pi^2} \right)^{1/2} \varepsilon(k,\lambda) \cos(k \cdot r - \omega t + \theta(k,\lambda))$$

random phase

$$B_{ZP}(r,t) = \sum_{\lambda=1}^{2} \int d^3k \left(\frac{\hbar \omega}{2\pi^2} \right)^{1/2} (k \times \varepsilon(k,\lambda)) \cos(k \cdot r - \omega t + \theta(k,\lambda))$$
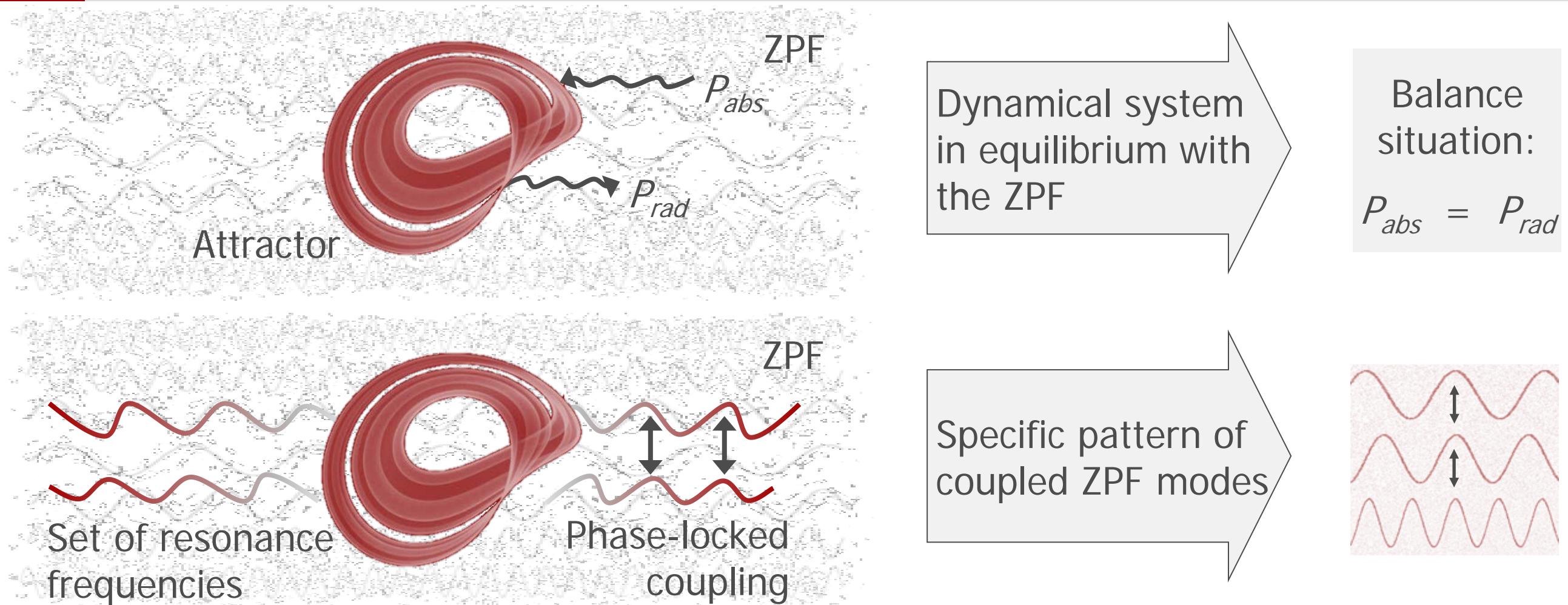
$$\rho_{ZP}(\omega) = \frac{\hbar \omega^3}{2\pi^2 c^3}$$

characteristic power spectrum

▸ Modern physics is based on the conception that the vacuum is imbued with permanent activity, represented by a real, all-pervasive stochastic radiation field, called zero-point field (ZPF).

▸ The ZPF functions as a formative agent behind the scenes that is perfectly qualified for playing the dual role as both the carrier of energy and consciousness.

The formation of an attractor imprints a characteristic information state on the ZPF

ZPF

P_{abs}

P_{rad}

Attractor

Dynamical system in equilibrium with the ZPF →

Balance situation:

$$P_{abs} = P_{rad}$$

ZPF

Set of resonance frequencies

Phase-locked coupling

Specific pattern of coupled ZPF modes →

- ▸ Electrically charged constituents of every physical system interact permanently with the ZPF, thus behaving as stochastic oscillators.
- ▸ Under appropriate conditions a balance situation can be reached; the system falls into an attractor and enters the quantum regime.
- ▸ The formation of an attractor is accompanied by a pattern of phase-locked ZPF modes (ordered state = ZPF information state).

Transiently stable attractors are the neural correlates of consciousness (NCC)
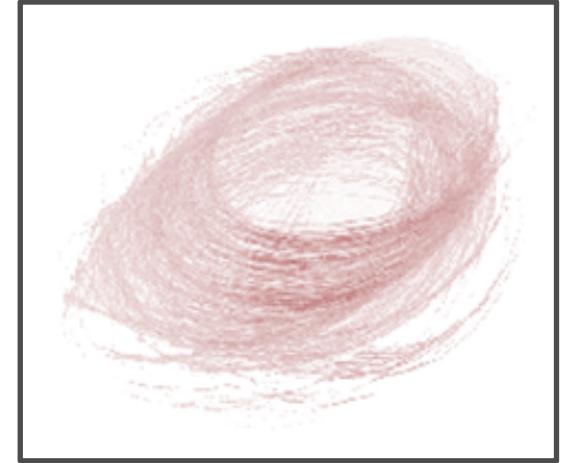
Disordered phase /
unconscious phase

Brain operates near a
critical point of a phase transition

Ordered phase /
conscious phase

Irregular dynamics

Spontaneous activity

1/f scaling behavior

Appropriate stimulus induces
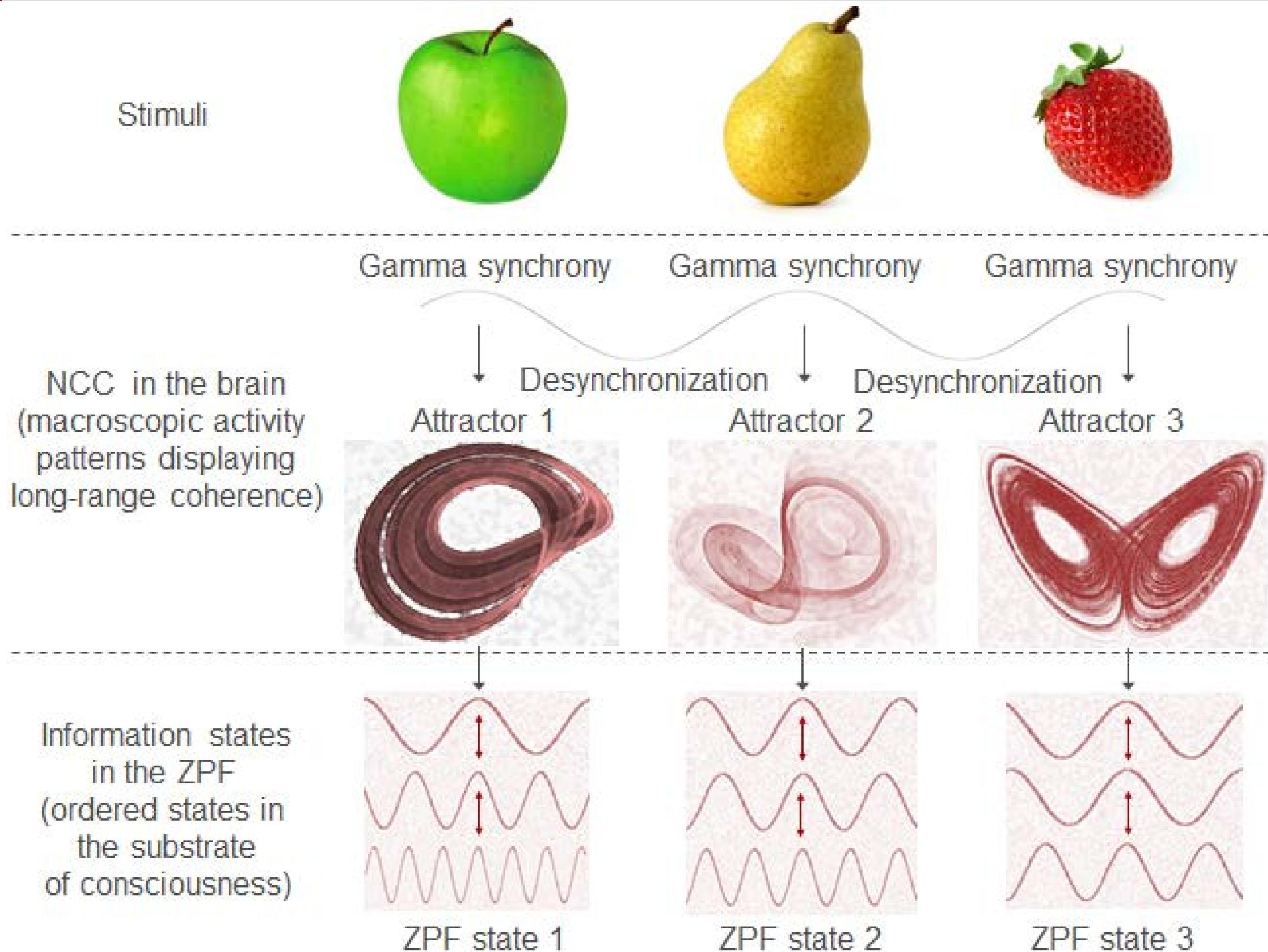an abrupt phase transition

Long-range correlations
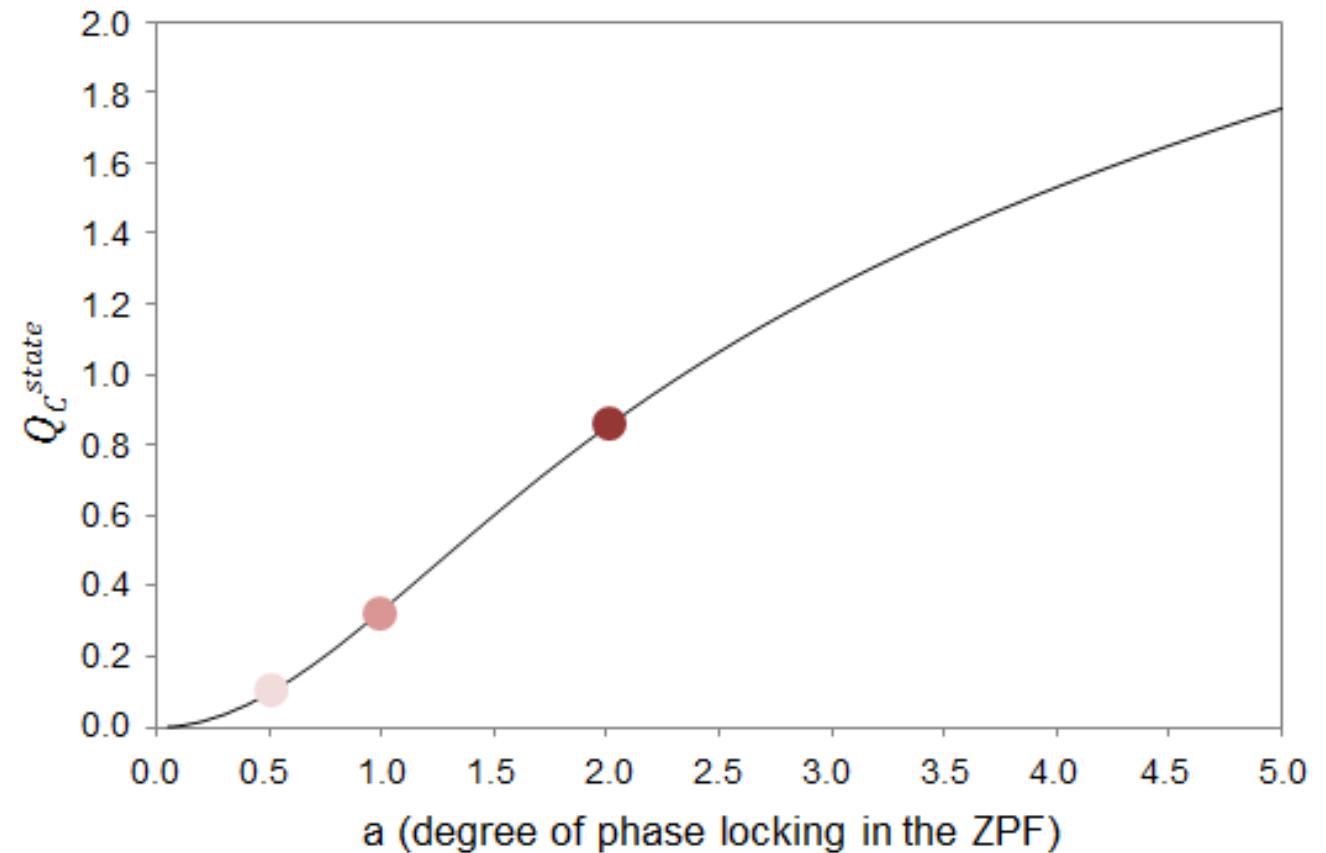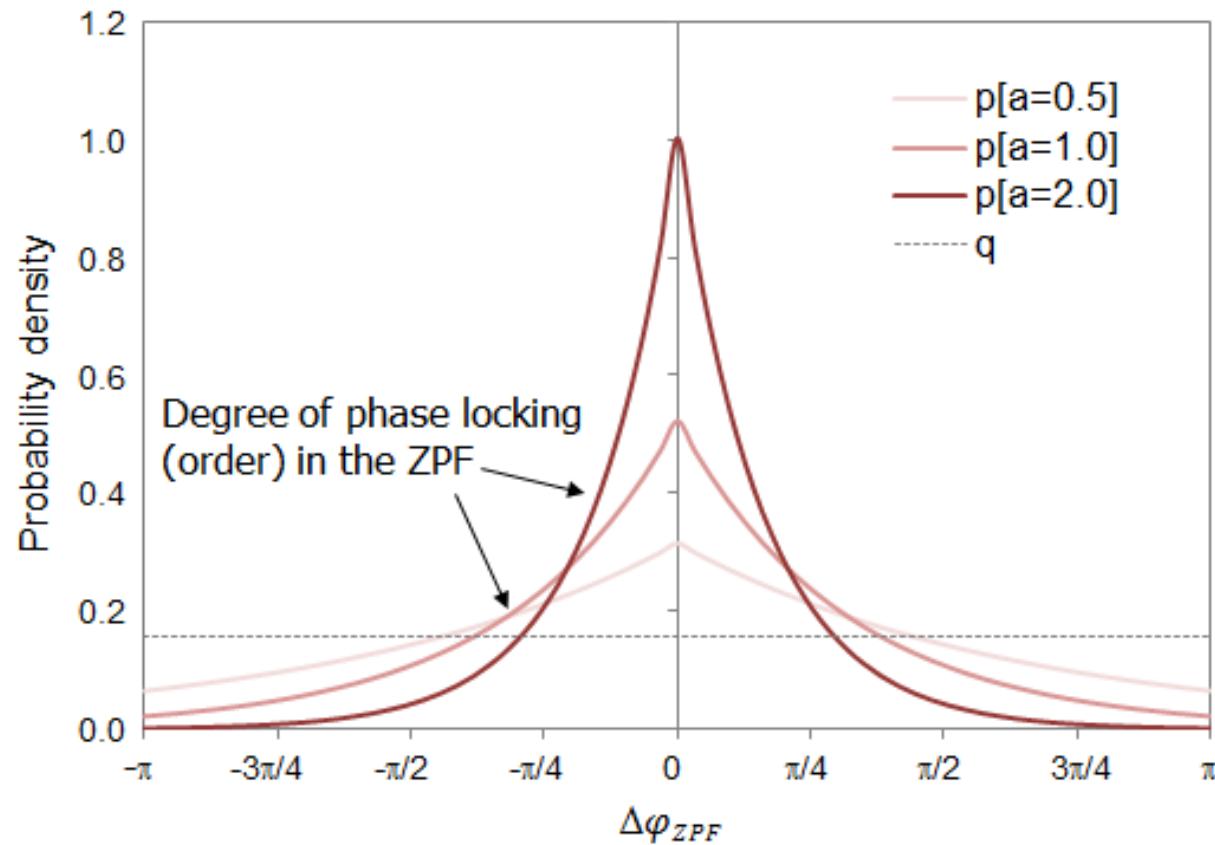(gamma synchrony)

Transiently stable attractors

▸ The neurophysiological body of evidence supports the view that conscious states correlate with transiently stable attractors, each of which is accompanied by a specific ZPF information state.

▸ This can be interpreted in such a way that only those brain processes that are able to exert influence on the ZPF have the potential to exceed the threshold to conscious experience.

Stimuli

Gamma synchrony   Gamma synchrony   Gamma synchrony

NCC in the brain (macroscopic activity patterns displaying long-range coherence)

Desynchronization   Desynchronization

Attractor 1   Attractor 2   Attractor 3

Information states in the ZPF (ordered states in the substrate of consciousness)

ZPF state 1   ZPF state 2   ZPF state 3

- A universal measure for the quantity of consciousness of a state (Q_C^{state}) is the degree of order in the local ZPF.
- This measure expresses the information gain of an ordered ZPF state [$p(\Delta\varphi_{ZPF})$] compared to the disordered initial state [$q(\Delta\varphi_{ZPF})$]:

$$Q_C^{state} = \int_{-\pi}^{\pi} p(\Delta\varphi_{ZPF}) \log\left(\frac{p(\Delta\varphi_{ZPF})}{q(\Delta\varphi_{ZPF})}\right) d(\Delta\varphi_{ZPF})$$
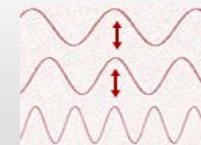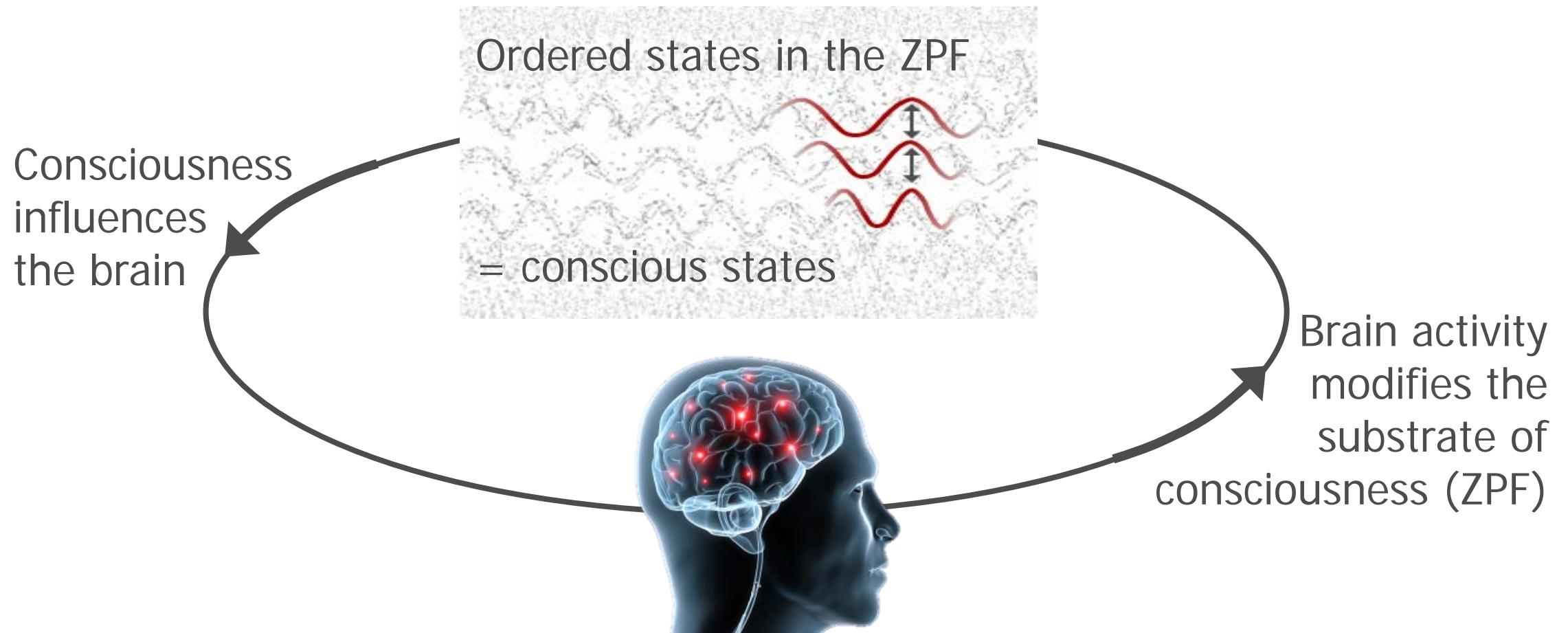
Qualia space can be systematically explored by classifying ZPF information space

First person account: color sensation

Attractor

ZPF information state
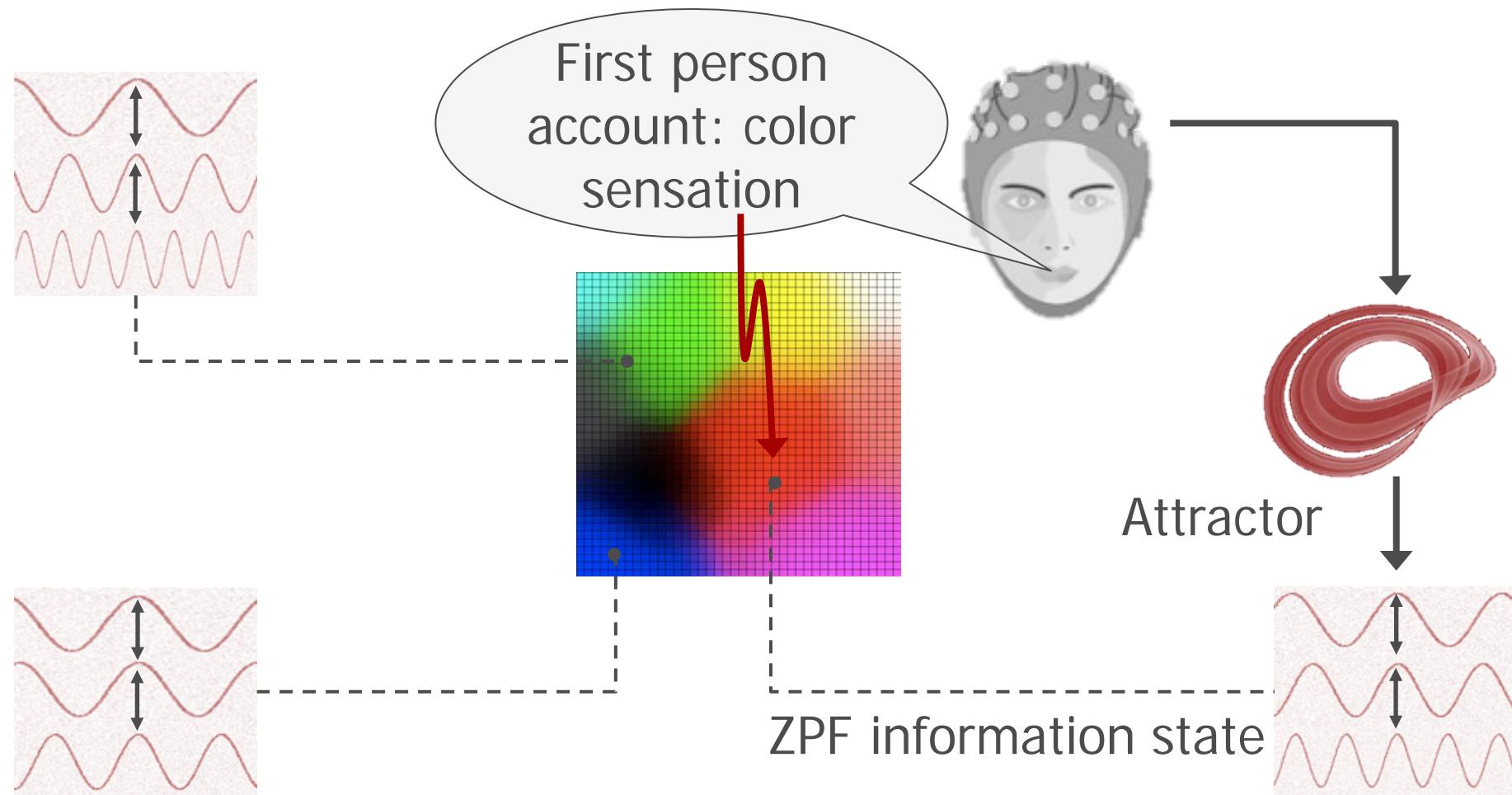
▸ A test person is exposed to a variety of stimuli, inducing conscious states that are subsequently described by the person.

▸ The ZPF information states associated with the induced conscious states have to be reconstructed from the attractors.

▸ In this way, ZPF information space can be classified (calibrated) on the basis of the first-person accounts.

Ordered states in the ZPF

= conscious states

Consciousness influences the brain

Brain activity modifies the substrate of consciousness (ZPF)

▸ The proposed solution leads to a consistent explanation of the dynamical properties of the neural correlates of consciousness.

▸ Moreover, the specified mechanism behind conscious systems offers an explanation for the unity of phenomenal awareness.

▸ The conceptual framework thus defined constitutes a solid basis for a future theory of consciousness.