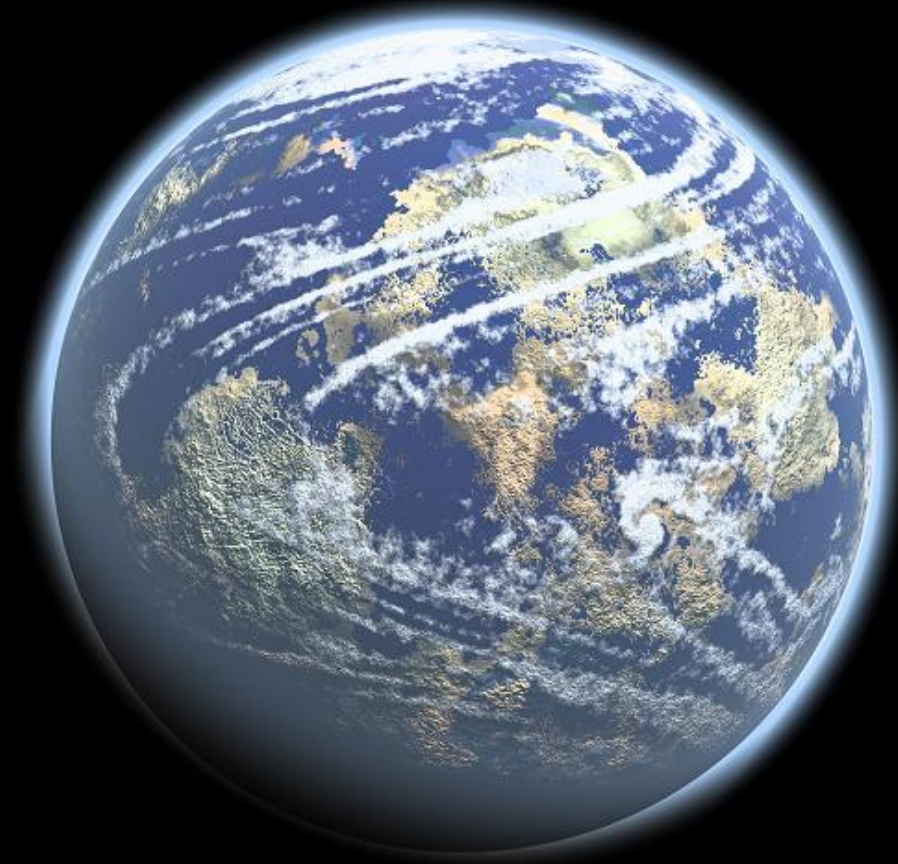


ASTRONOMY WINTER SCHOOL HYDERABAD 2017



SUPPLEMENT
NON-CLASSICAL REALM; ILLUSIONS

FALSIFY

OBSERVATION(S)

Particulars

Abstraction
↓
Understanding

MODEL
Universals

Reasoning
↓

IDEAS: Propositions (of relationships)
Hypotheses (of phenomena)

Generalization
via Applications
↓

RELATIONS
LAWS (predictions)

Generalization
via Theory
↓

→ **Empirical Illusions: repeat/verify**

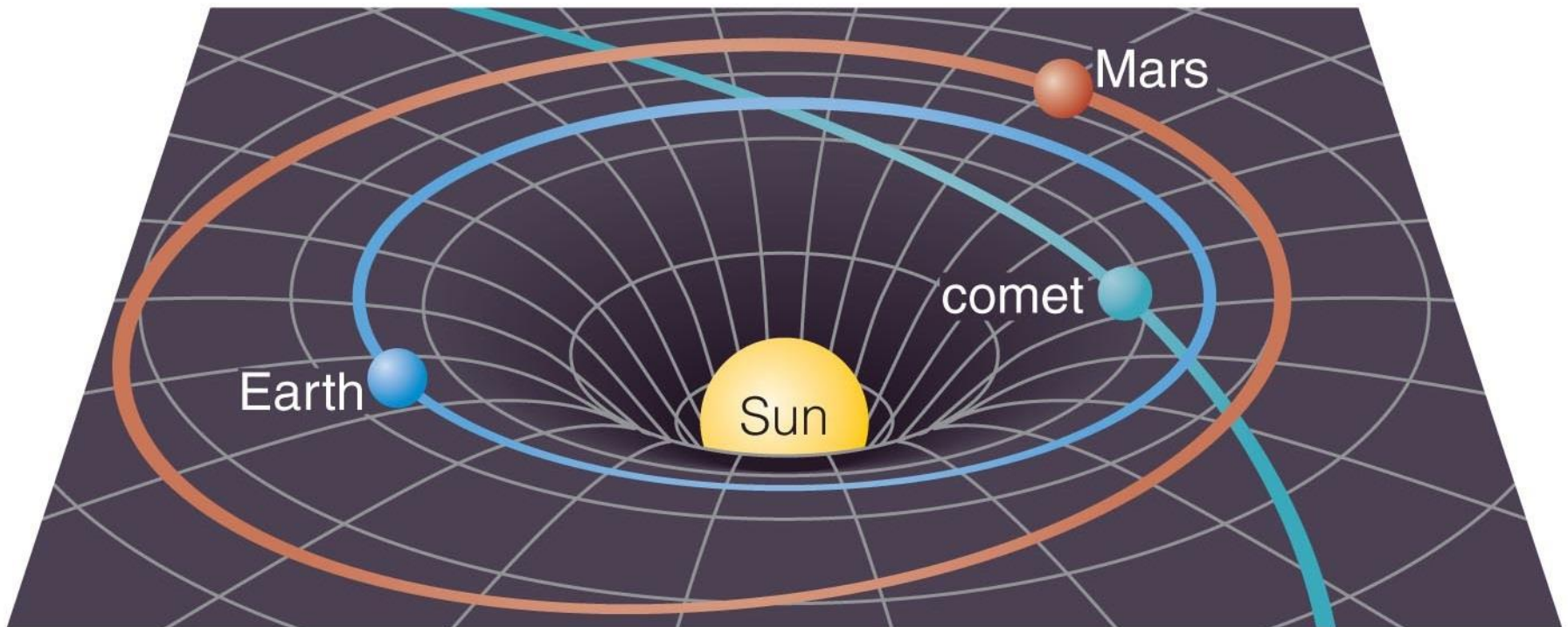
→ **Logical Illusions: rethink or useless: abandon**

→ **Transcendental Illusions: analyze for bias**

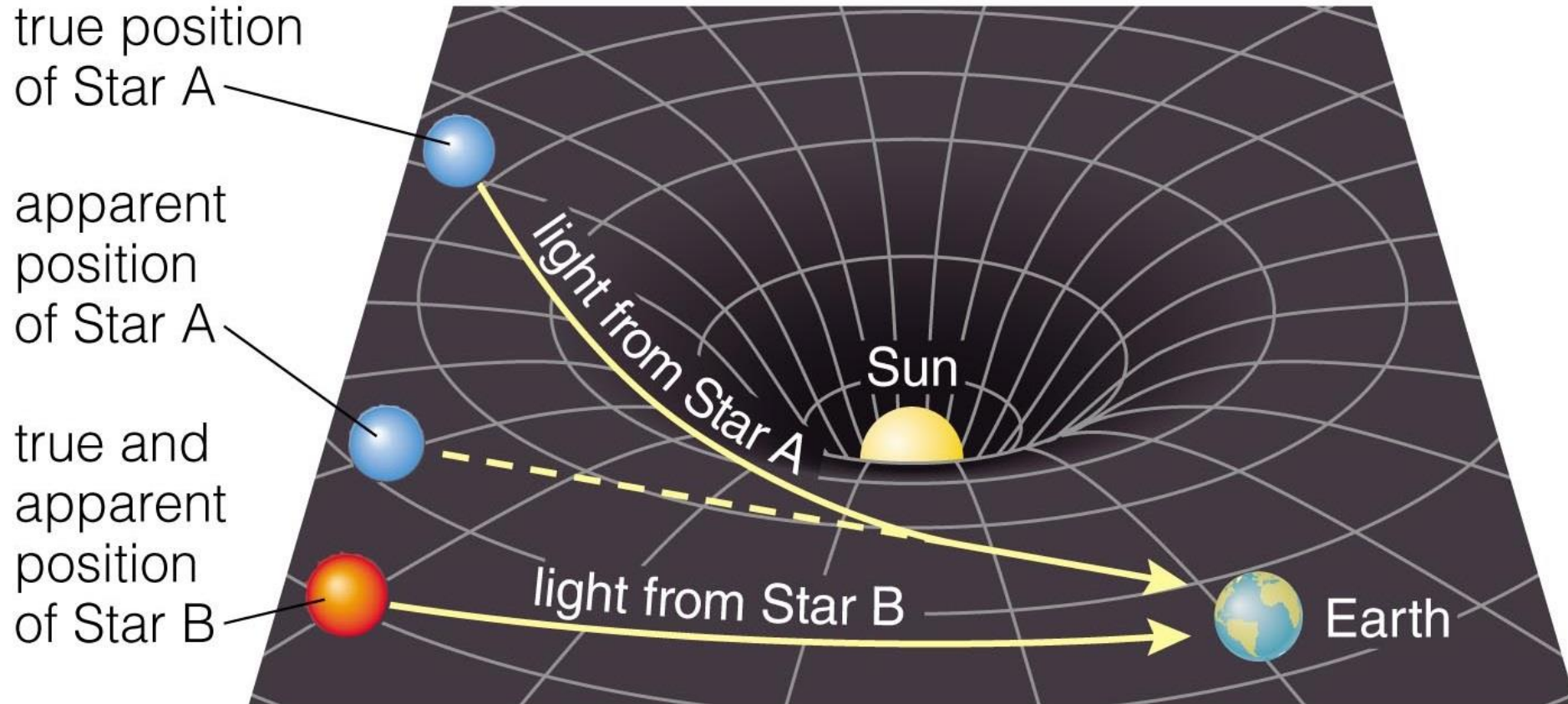
→ **Either terminate ideas outright, or add conditions to confine the manifold of subsumed systems**

**Models relate to observations problematic,
never assertive or even apodictic**

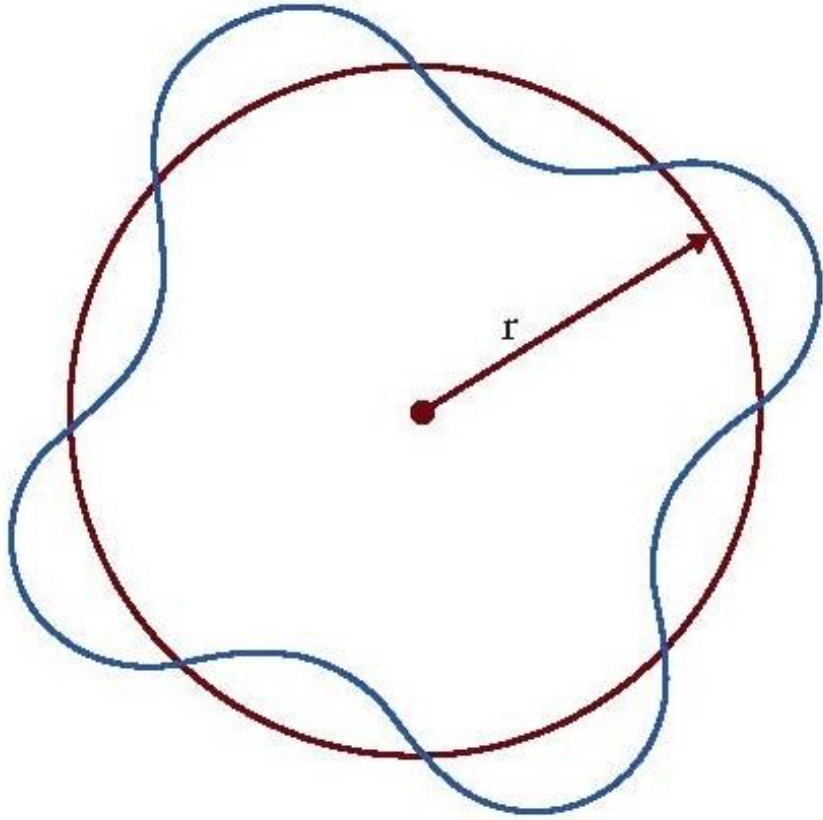
General Relativity: Gravity is the curvature of Space-time caused by massive objects



General Relativity affects light



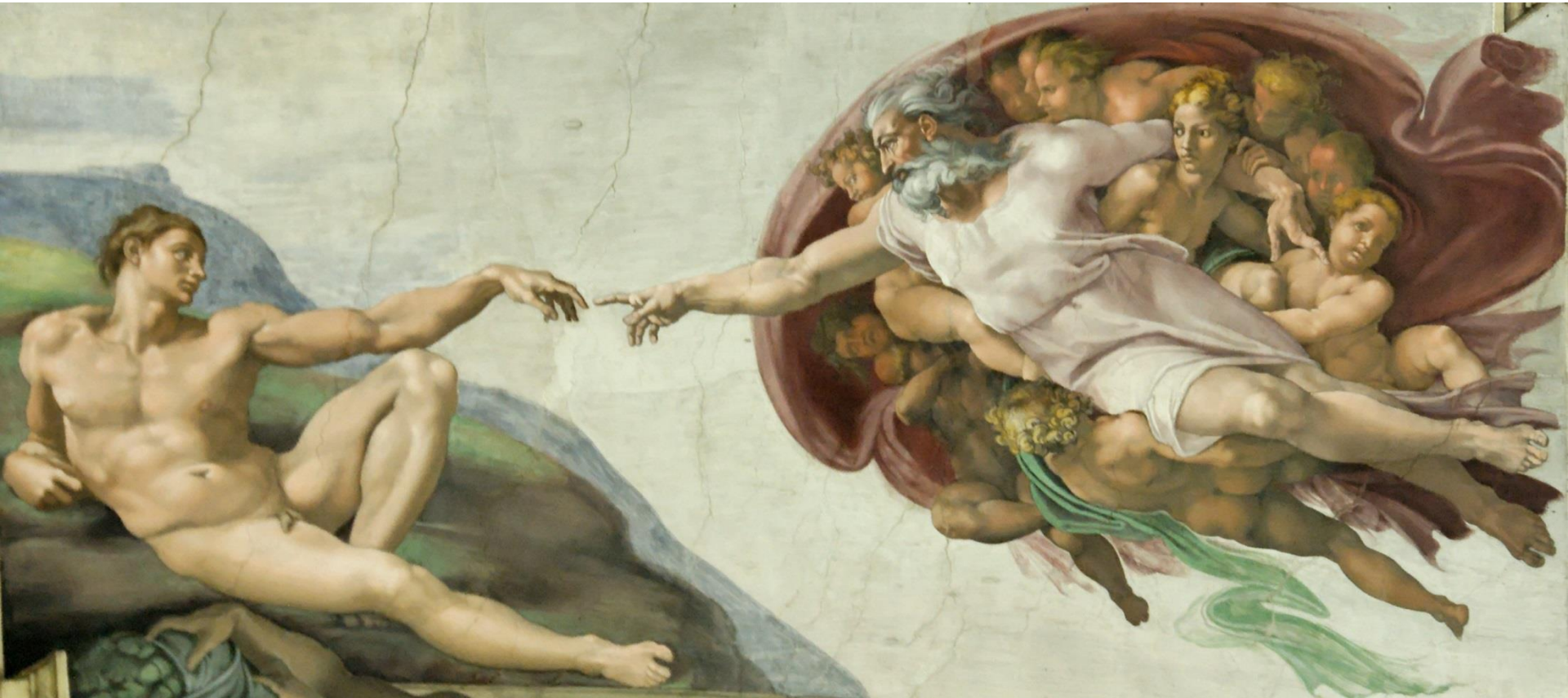
Particle-Wave Dualism



Louis de Broglie
(1892 – 1987)



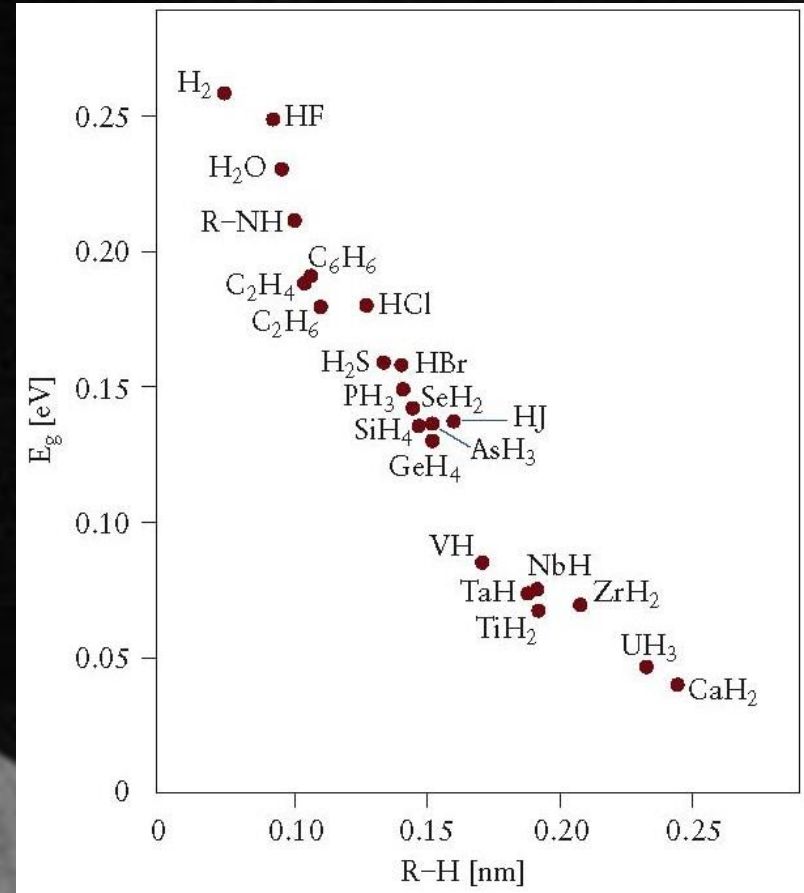
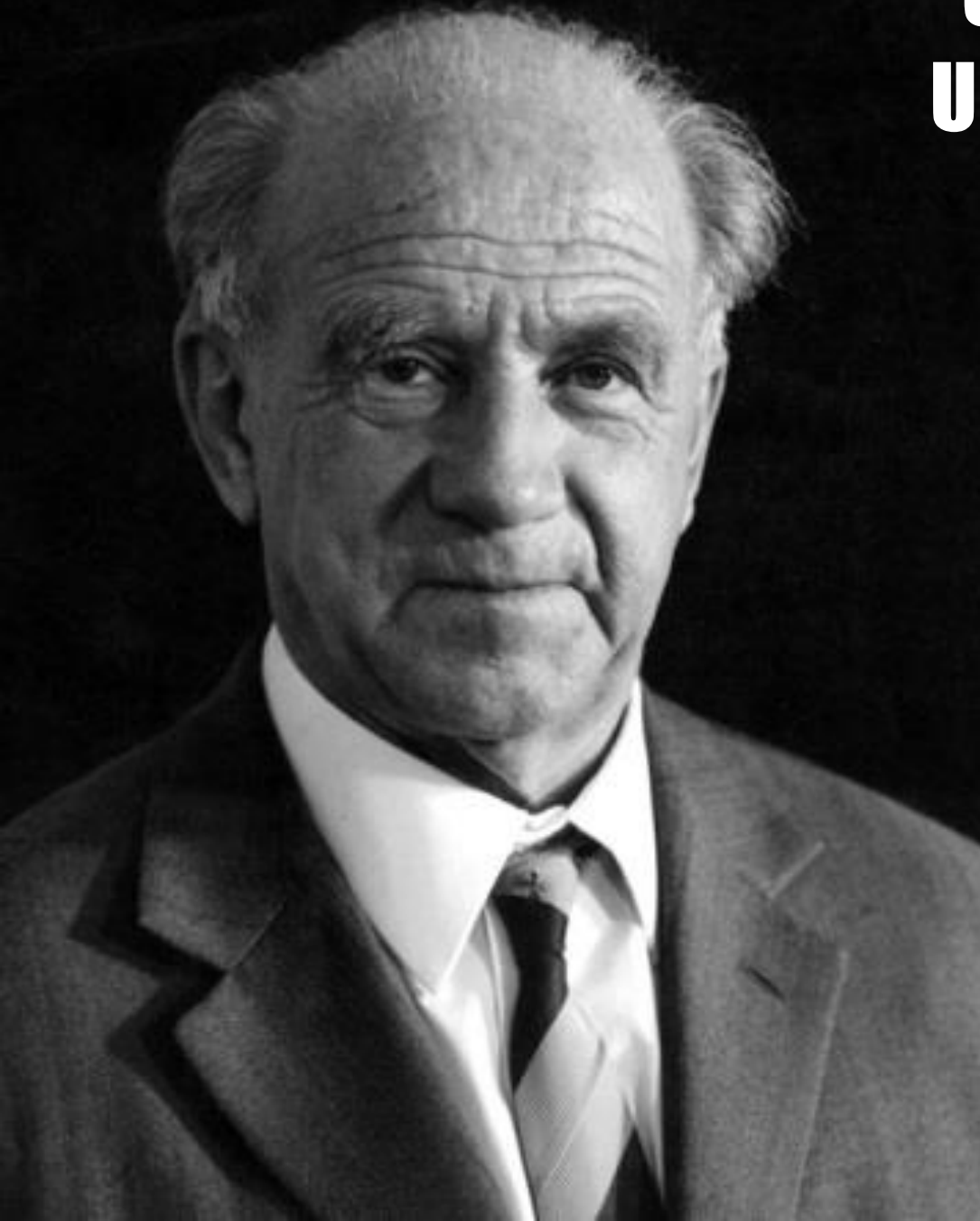
Show what is Transcendental



**The Creation of Adam, Sistine Ceiling
Michelangelo Buonarroti (1475 – 1564)**

Quantum Mechanics

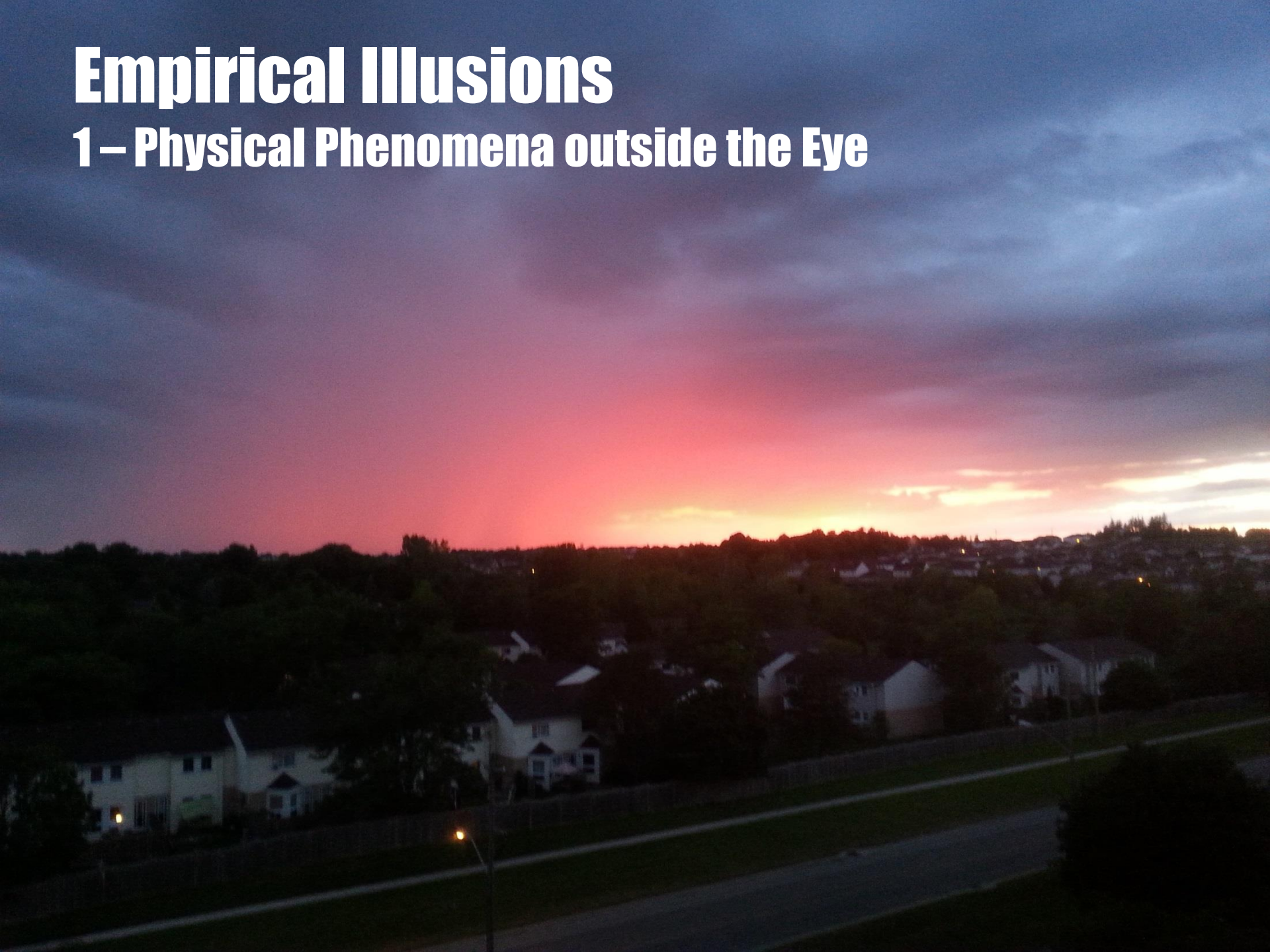
Uncertainty Principle



Werner Heisenberg
(1901 – 1976)

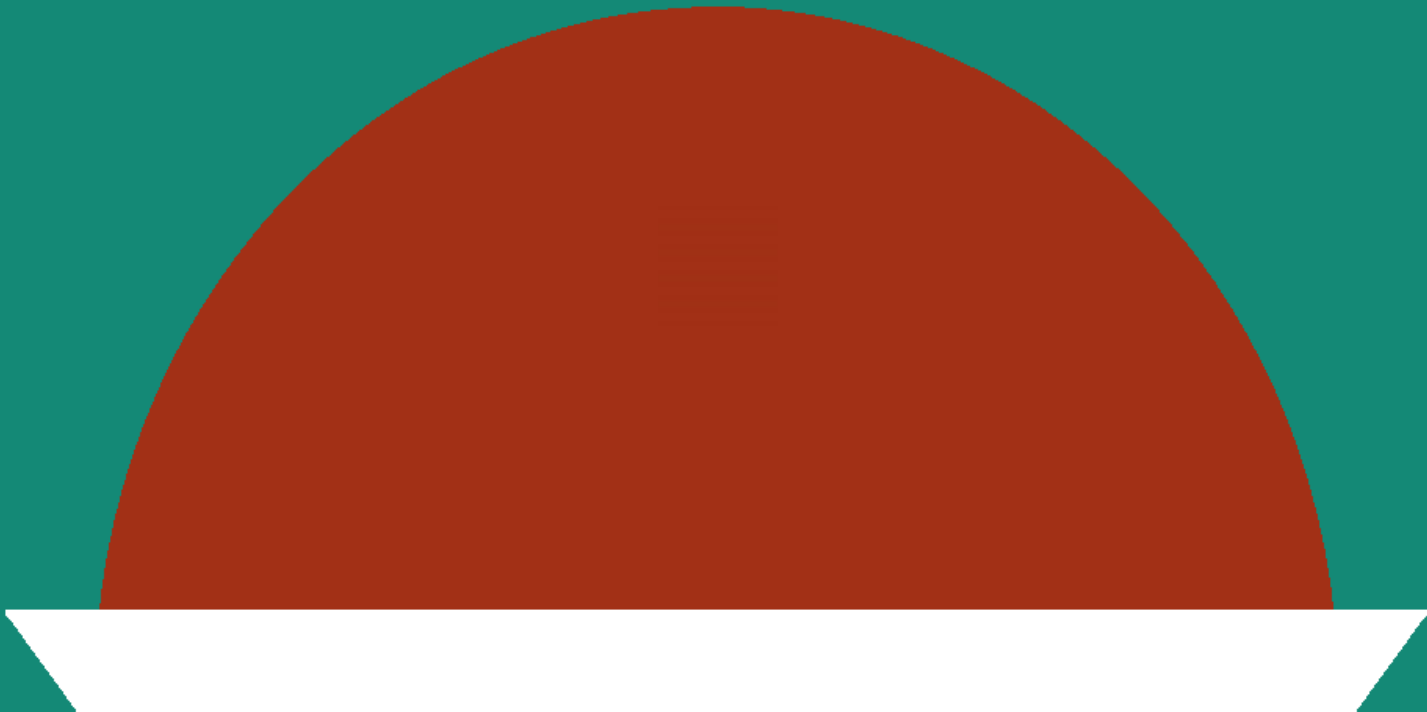
Empirical Illusions

1 – Physical Phenomena outside the Eye



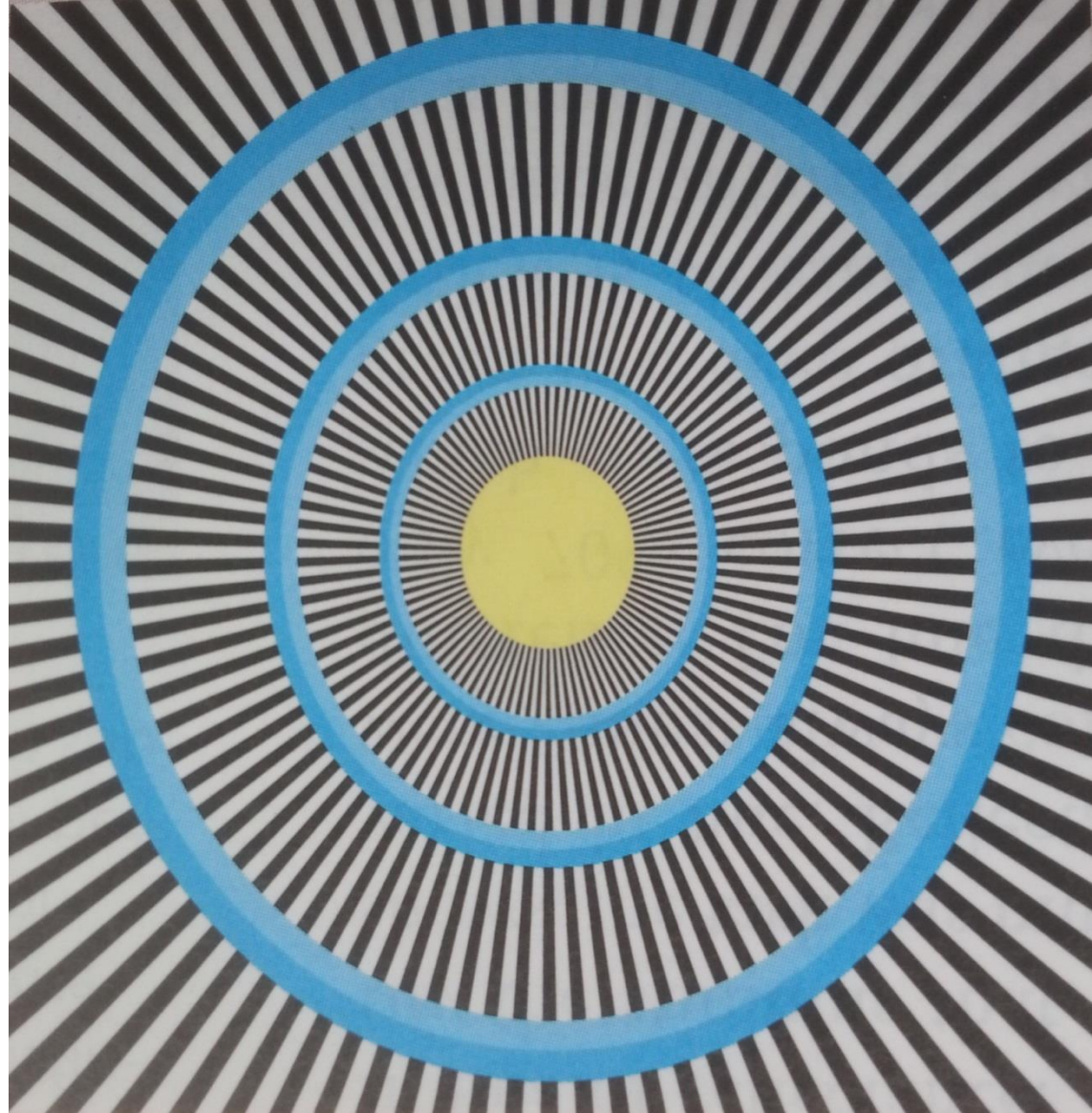
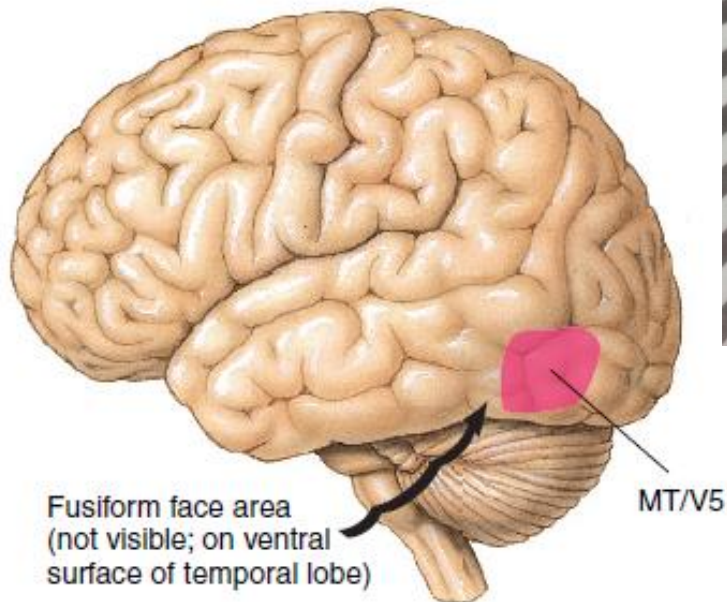
Empirical Illusions

2 – Physiochemical effect in individual cones in retina



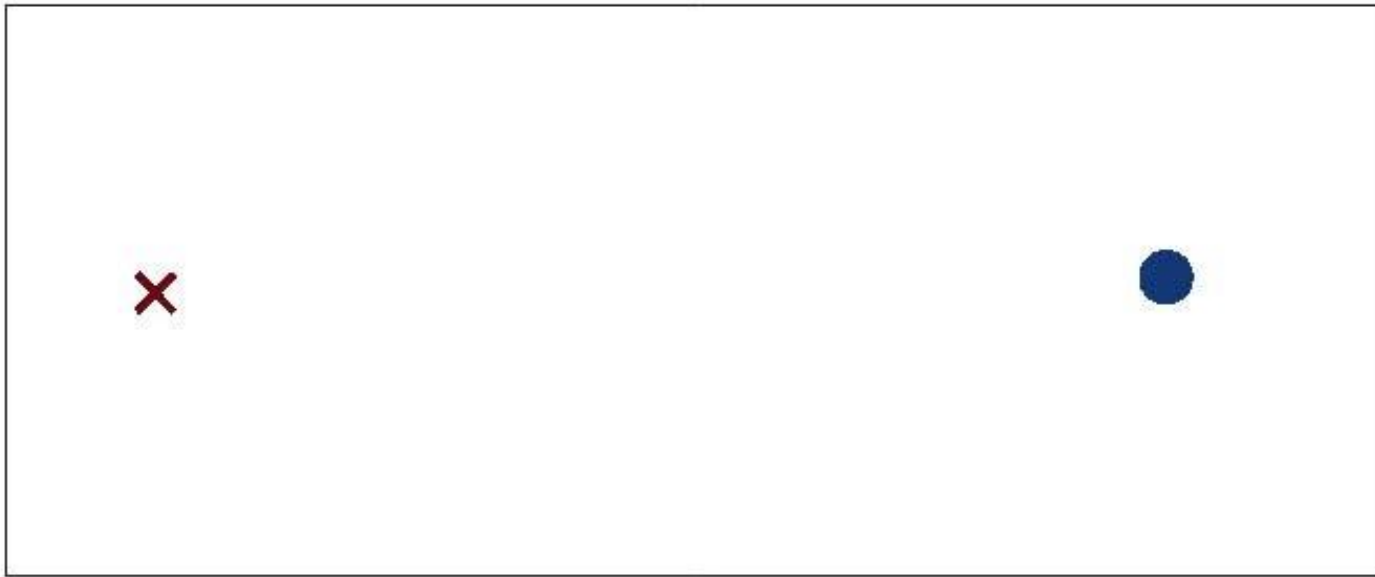
Empirical Illusions

3 – Motion Illusion in Visual Cortex (Area MT)



Insufficiency Errors

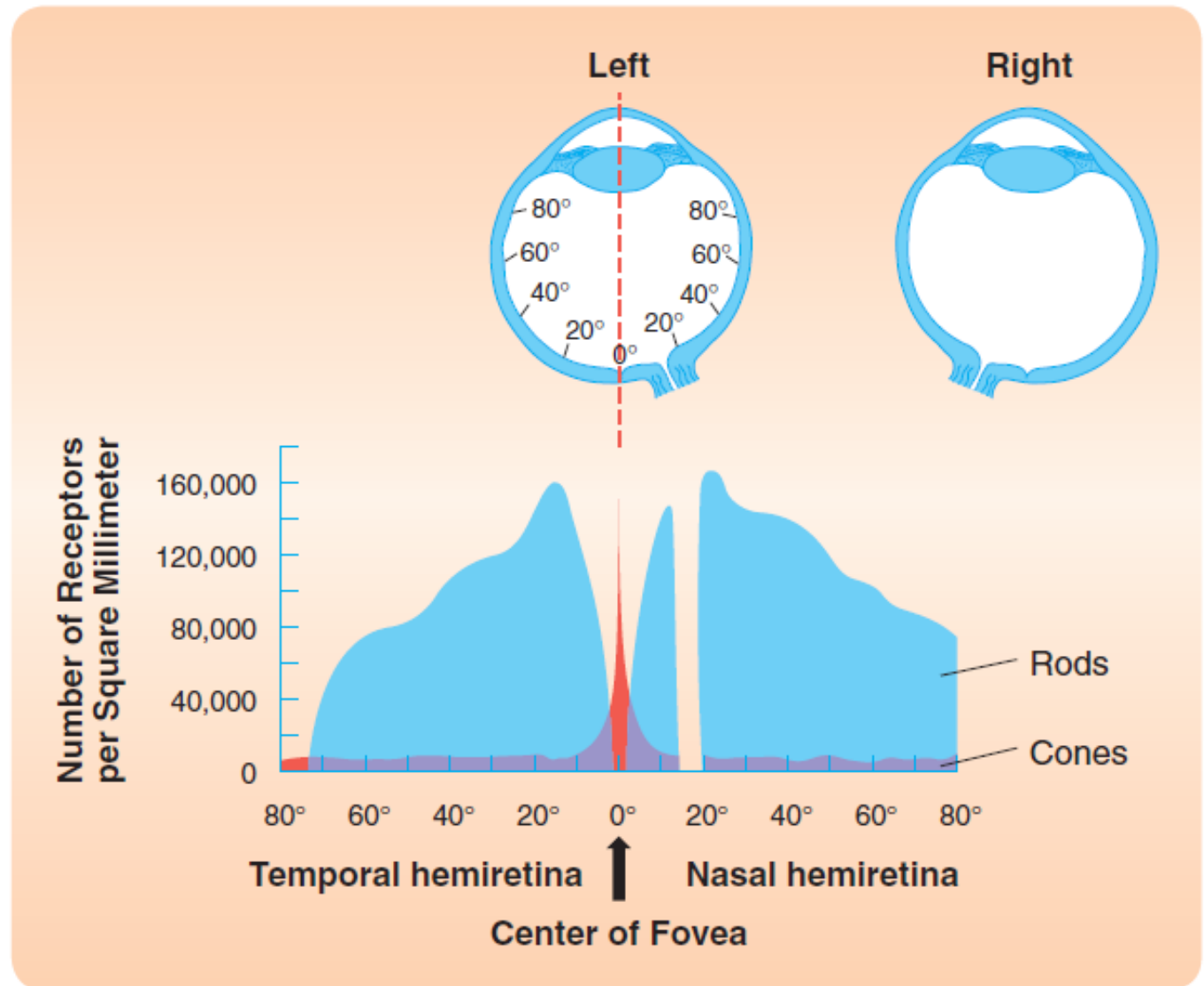
1 – brain fills in where vision fails



The red cross will disappear as you approach the blue dot with your face and the right eye closed

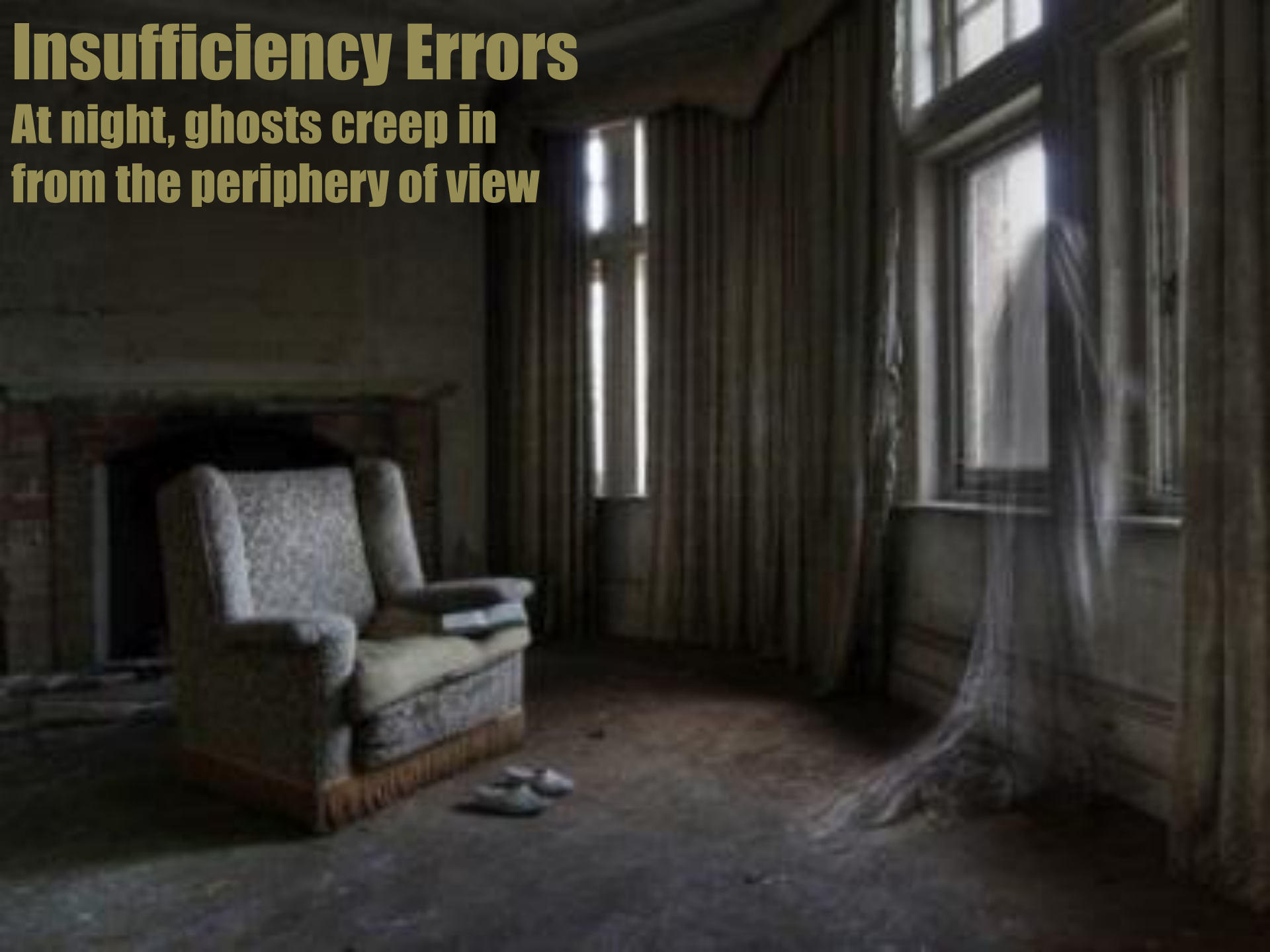
Insufficiency Errors

2 – Field-of-view varies for cones and rods non-congruent



Insufficiency Errors

At night, ghosts creep in
from the periphery of view

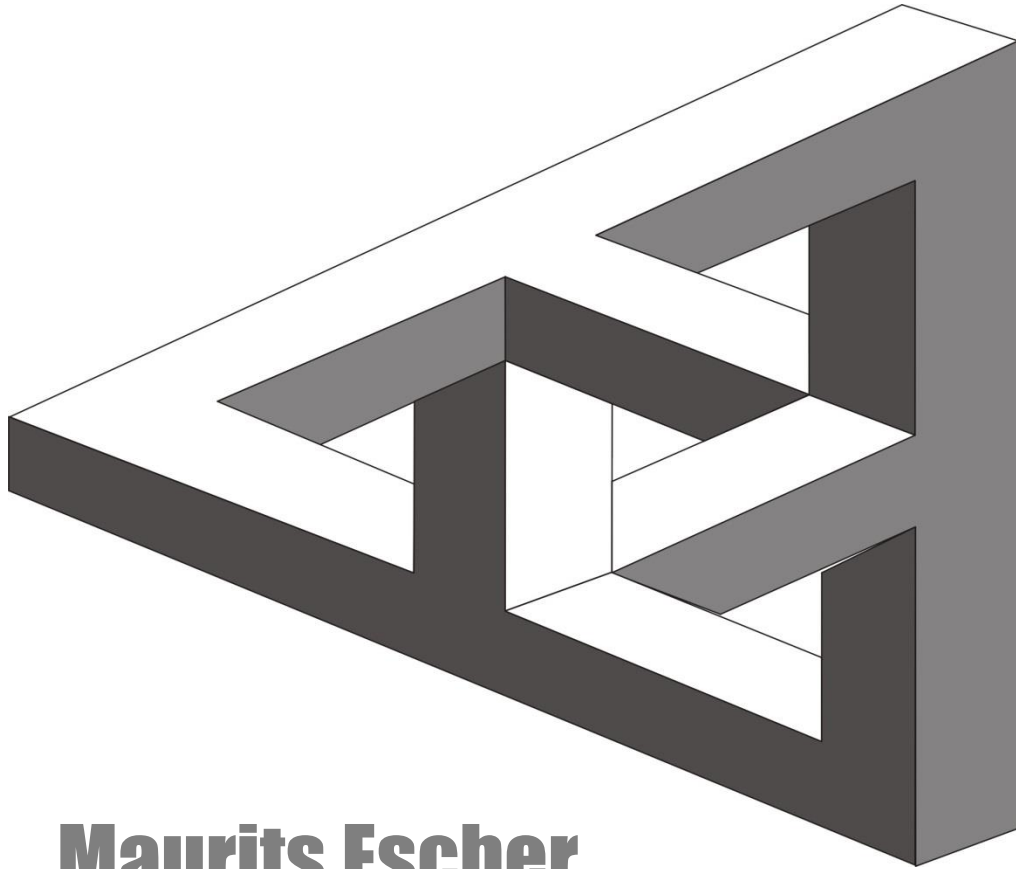




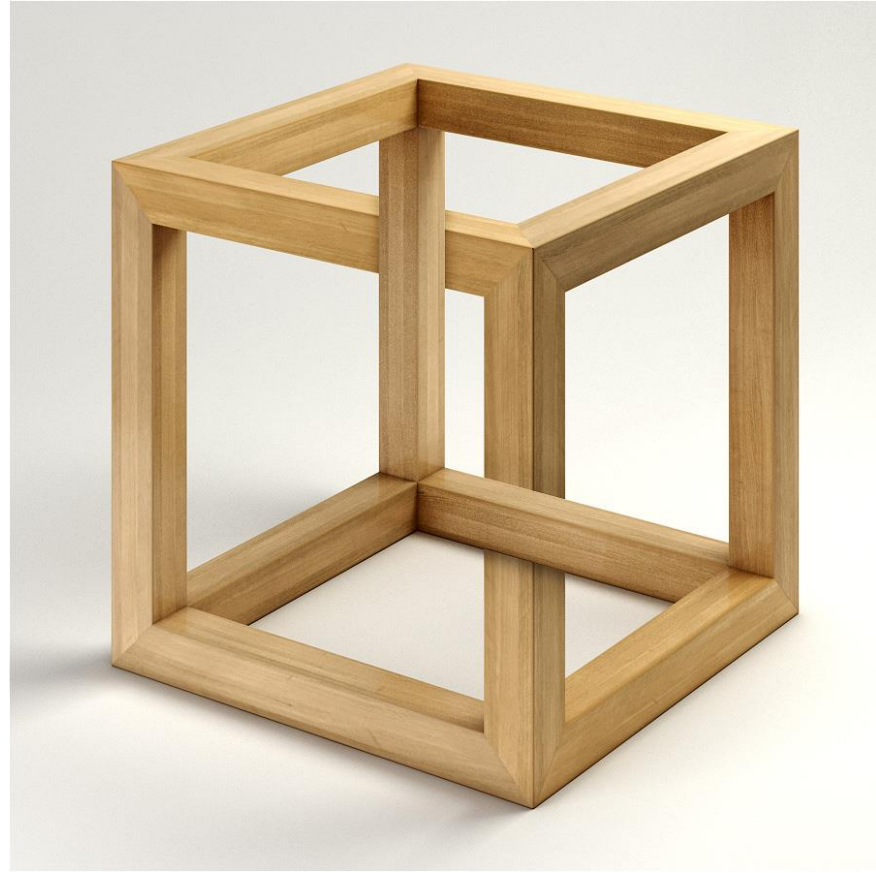
Disturbances
Phantom features of visual cortex (Fortification illusion)

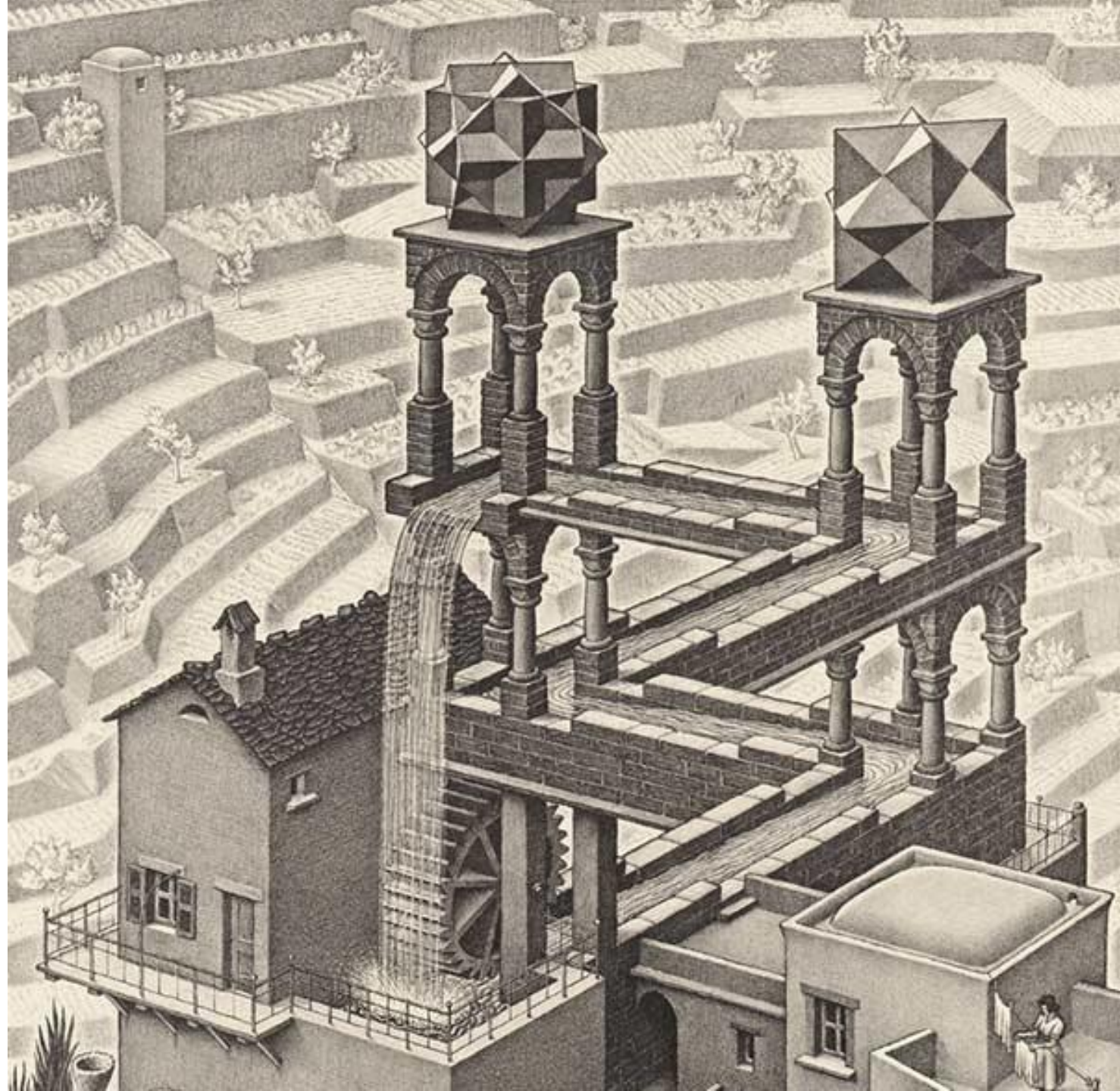
Logical Illusions

Global Image Synthesis along the Where-Pathway

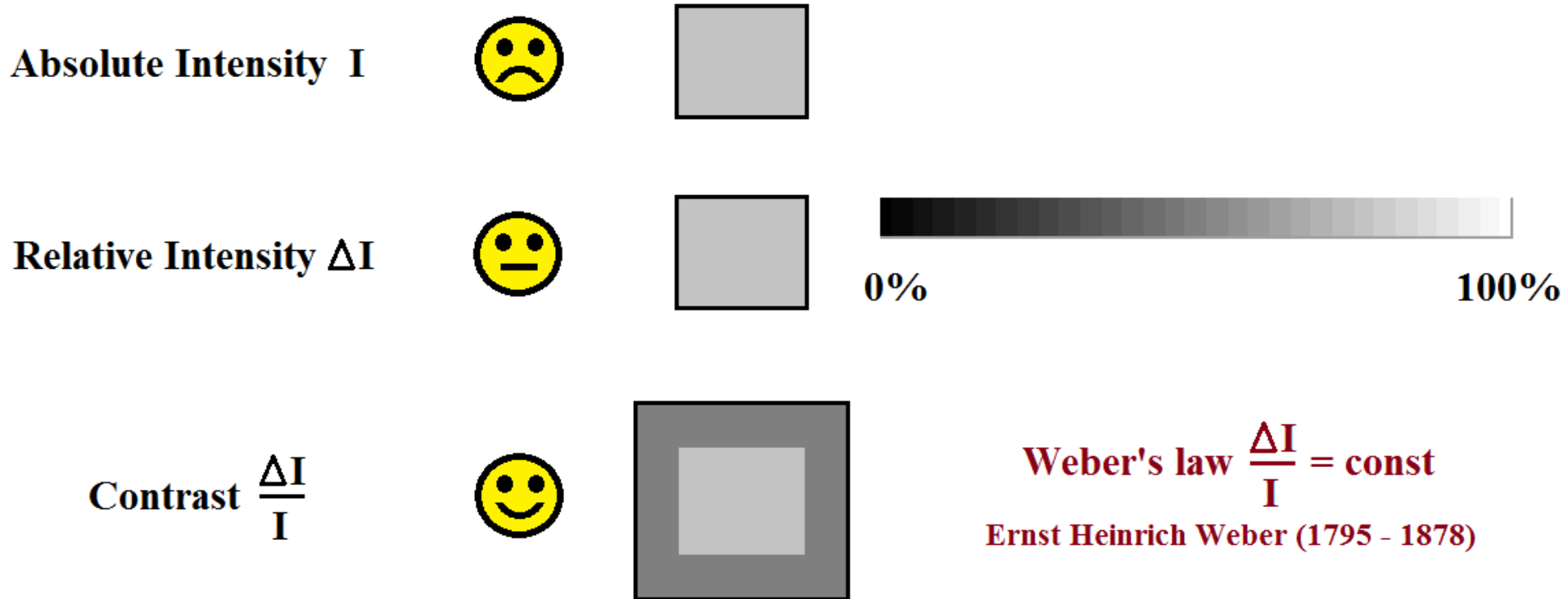


Maurits Escher
(1898 – 1972)





Quantitative Perception of Humans: absolute sensitivity is a transcendental illusion



Weber's law applies for the threshold of detection of differences

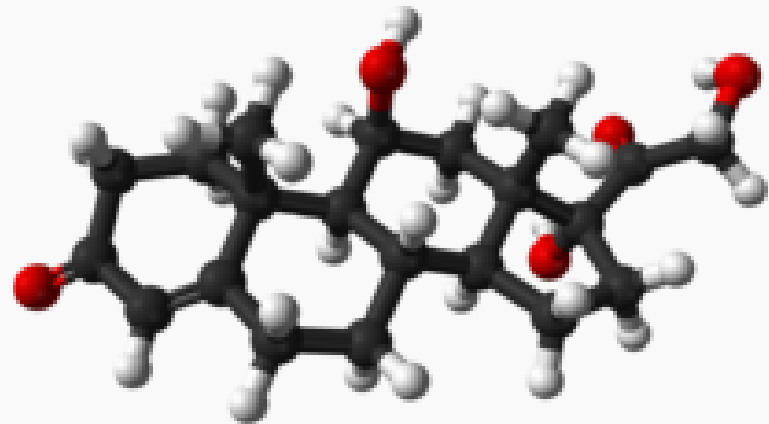
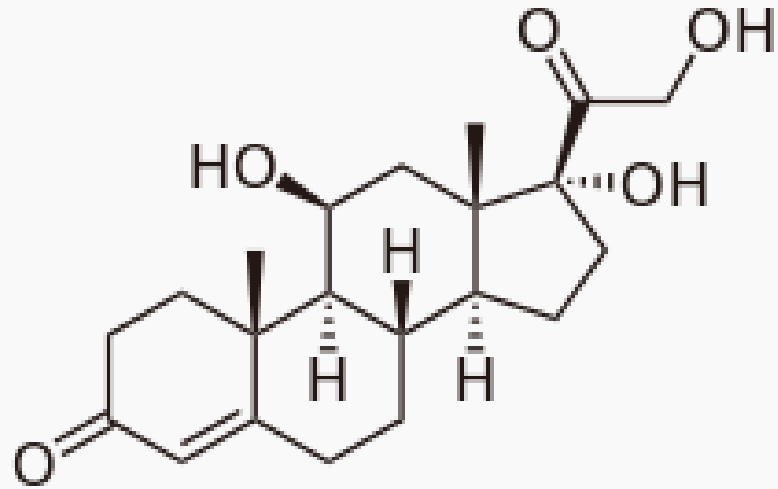


Stress Hormone

**At low levels supports episodic learning (what to avoid in the future).
At high levels prevents recall from memory (i.e., influences the balance between reason and emotion).**

Associated with trauma, stress, fear, ...

Cortisol



Systematic (IUPAC) name

(11 β)-11,17,21-trihydroxypregn-4-ene-3,20-dione



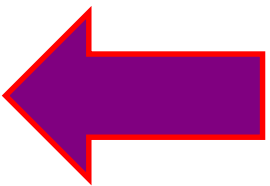
Cortisol level rises 15%

zdf_neo HD



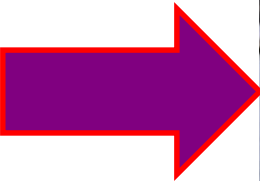
Doku

Cortisol level lowered 25%



Don't do this

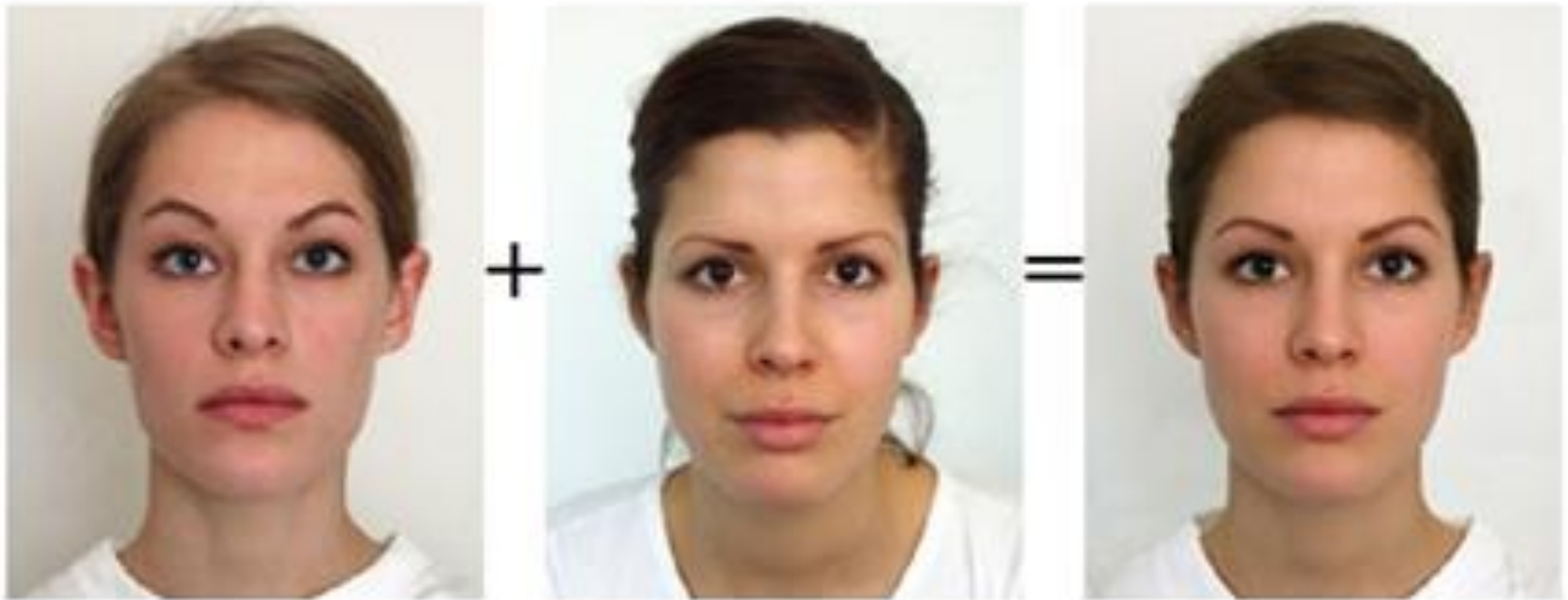
Do that !



WHICH WOMAN IS MOST BEAUTIFUL?



Arthur Schopenhauer (1788 – 1860): On love



If you mix the left picture with the one in the middle, the result is an intermediate between the two faces (see right picture).



Chinese



Hungarian



Japanese



Korean



Puerto Rican



Burmese



Cambodian



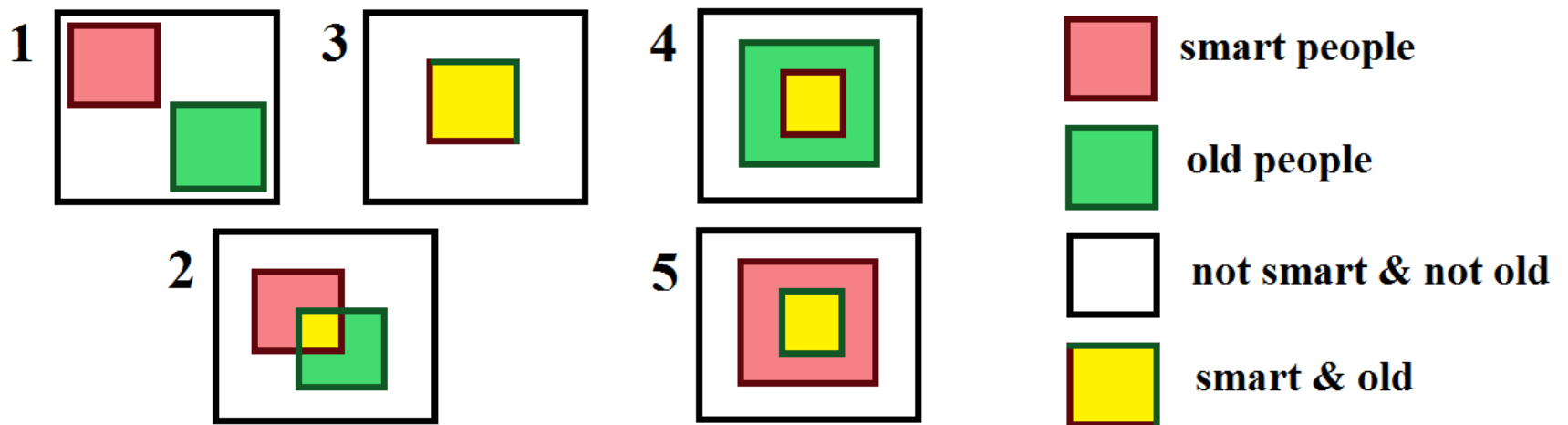
English


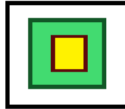
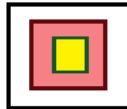
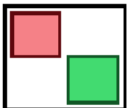
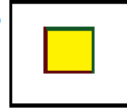
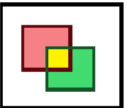
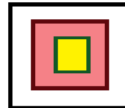
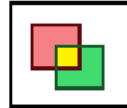
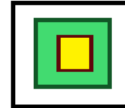


Ethiopian



Filipino



	if A is smart ...	if A is not smart ...
... then A is old	3  4  apodictic assertoric	5 
... then A is not old	1  impossible	3  (apodictic = sine qua non condition)
no statement follows can be statements	2  5  problematic	2  4  1 