

**Max-Wertheimer Minerva Center for  
Cognitive Processes and Human Performance**  
Head of Center: Prof. Asher Koriat      ראש המרכז פרופ' אשר קוריאט

אנו שמחים לארח את

**Prof. Jochen Braun (Cognitive Biology)**

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### *Why is visual perception multi-stable?*

Visual experience is an extrapolation of the retinal image on the basis of prior knowledge about the visual environment. Intriguingly, this inferential process frequently fails to reach a definitive conclusion so that visual experience of a stable scene continues to fluctuate between alternative percepts. This multi-stability of visual perception has long been attributed to adaptive processes that curtail the persistence of any dominant percept. However, more and more evidence points to a fundamentally stochastic, fluctuation-driven nature of multi-stable perception.

We have discovered subtle regularities in series of perceptual alternations that allow us to quantify the relative contributions of adaptive and stochastic processes to perceptual reversals. In collaboration with Gustavo Deco, Barcelona, we have used our observations to constrain a generic attractor network model for multi-stable perception (Moreno-Bote et al., 2007). In the context of this model, our measurements imply that multi-stable perception consistently straddles the dividing line between the oscillatory (adaptation dominated) and the bistable (fluctuation-driven) regimes. In other words, visual perception seems to be maintained in a state of criticality.

Excitable networks are known to respond most sensitively and with maximal dynamic range when in a state of criticality. Accordingly, visual perception may be maintained in a critical state in order to maximize sensitivity, with multi-stability as an unavoidable side-effect. Our conclusions throw a surprising new light on many well-known observations and raise several new questions. For example, they imply the existence of hitherto unsuspected homeostatic mechanisms.

ההרצאה תתקיים ביום ד' ה- 9 בספטמבר 2009, בשעה 14:00  
בחדר ההרצאות במעמק"ה, הבניין הרב תכליתי, אוניברסיטת חיפה.

**נשמח לראותכם בין אורחינו**

המעוניינים באישור כניסה לרכב לאוניברסיטה - אנא שלחו מייל לאתי לברן:

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