

# Complexity



"The laws of physics are simple nevertheless nature is complex".

Dante R. Chialvo

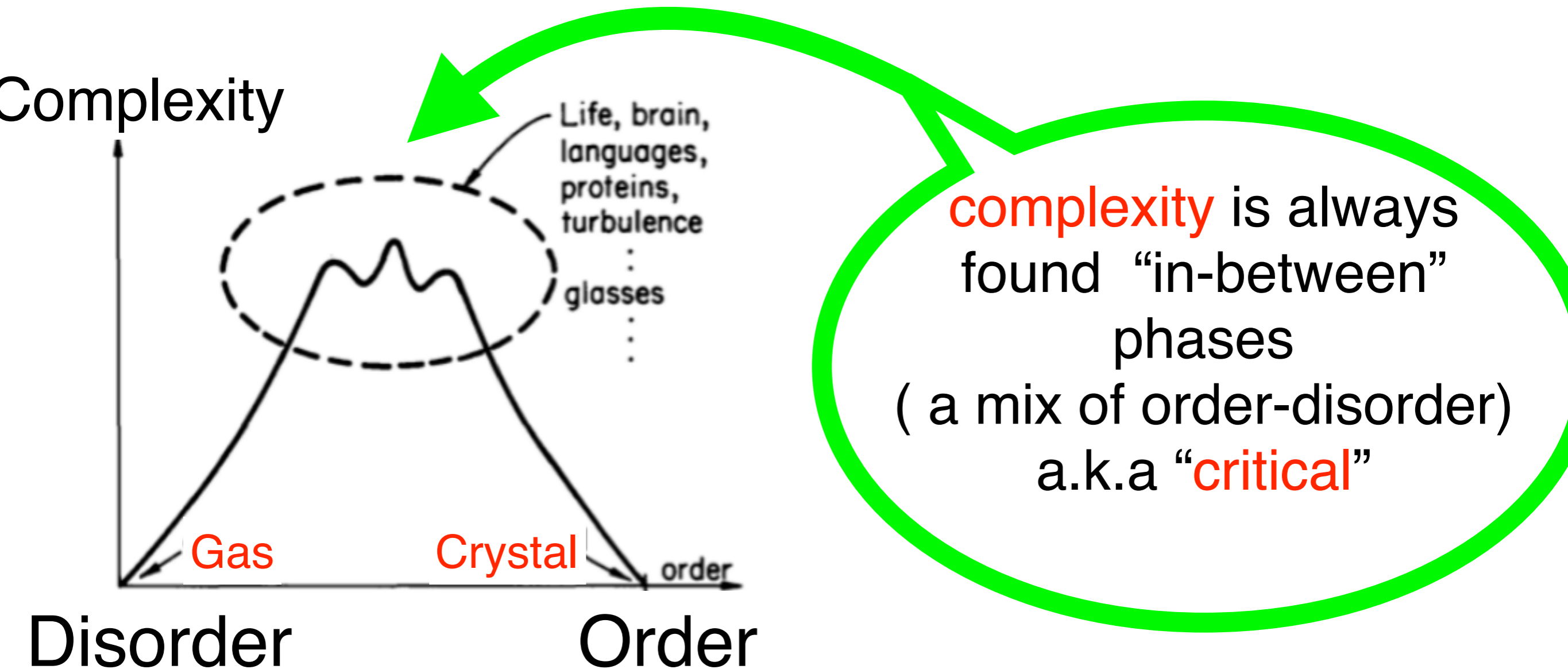
*CEMSC<sup>3</sup> -Center for Complex Systems & Brain Sciences*

*dchialvo@gmail.com*

Please see more information  
and publications in [www.chialvo.net](http://www.chialvo.net)



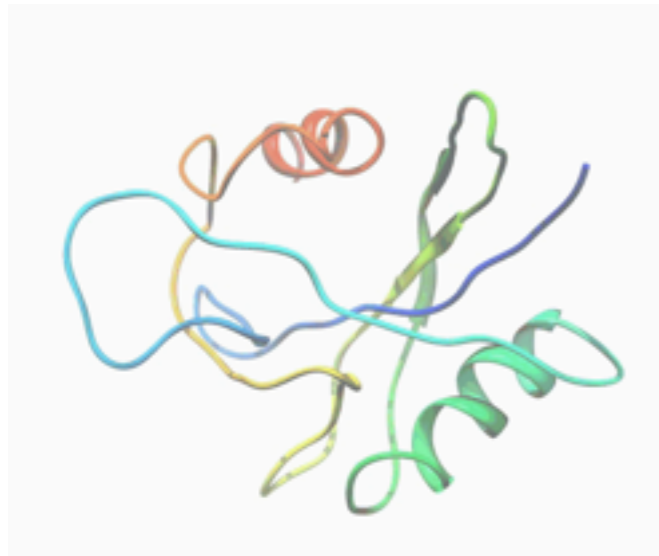
# Complexity in nature can be defined and quantified



Same simple laws originate simplicity and complexity,  
No need for “complex” laws for complexity

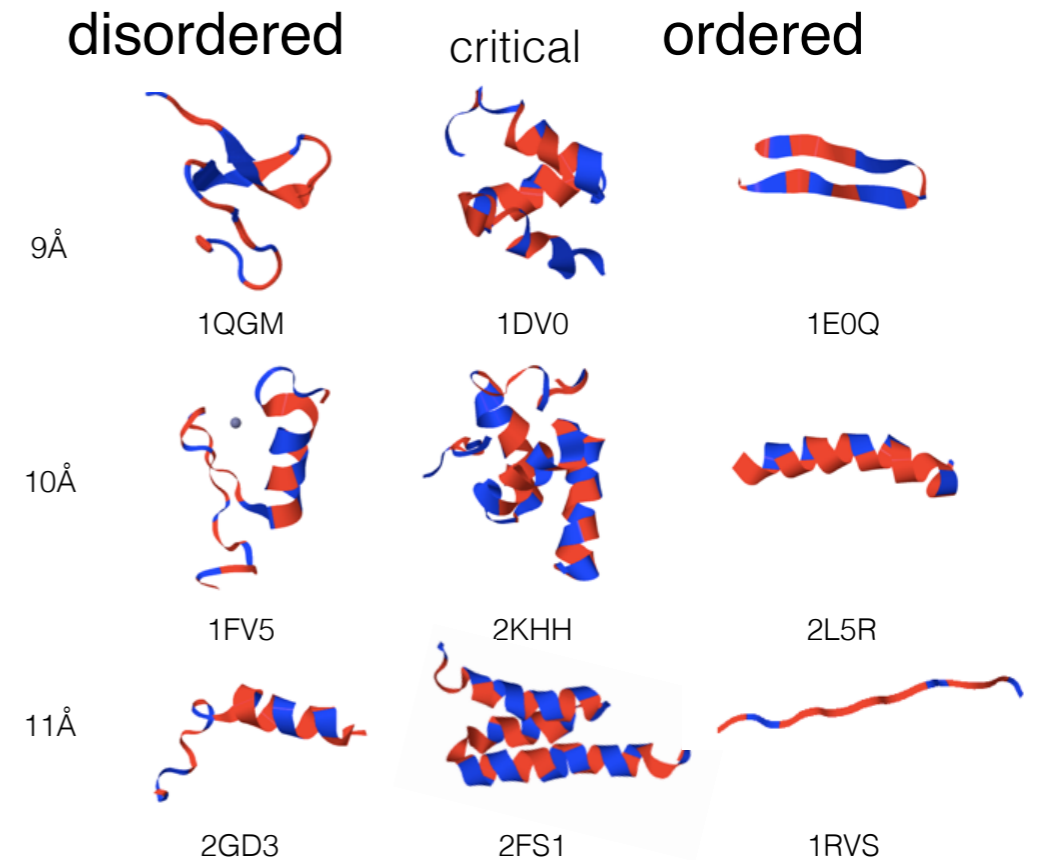


# Our lab study the complexity of “life at the edge”

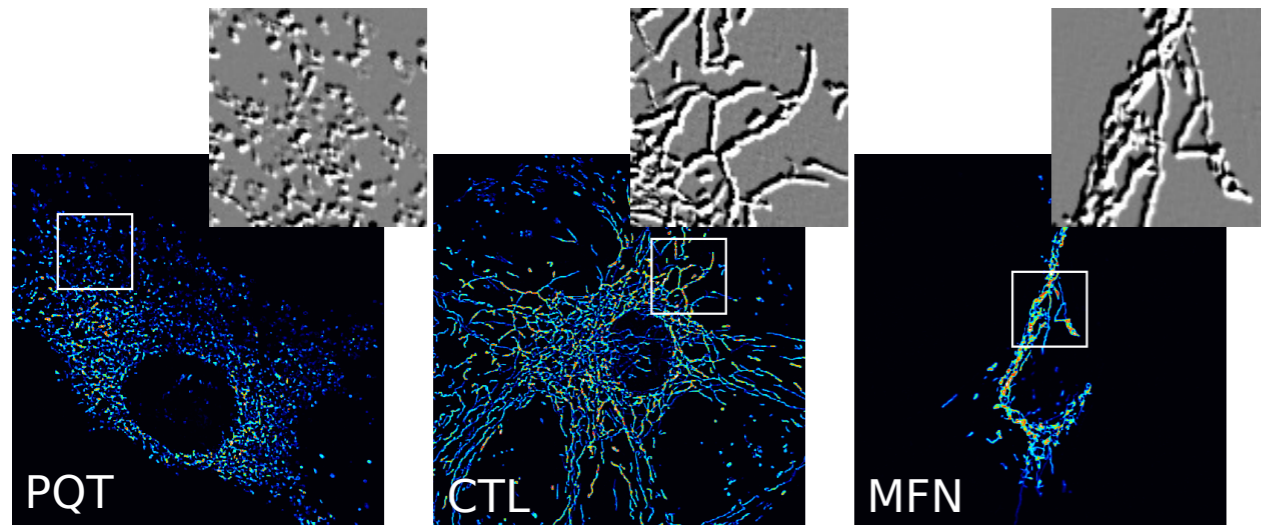


Proteins

Physical Review Letters 118 (8), 088102 (2017).



Mitochondria

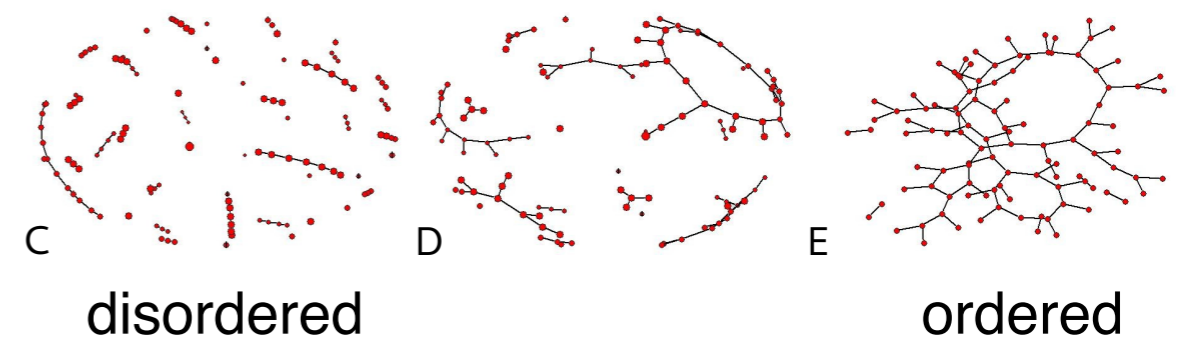
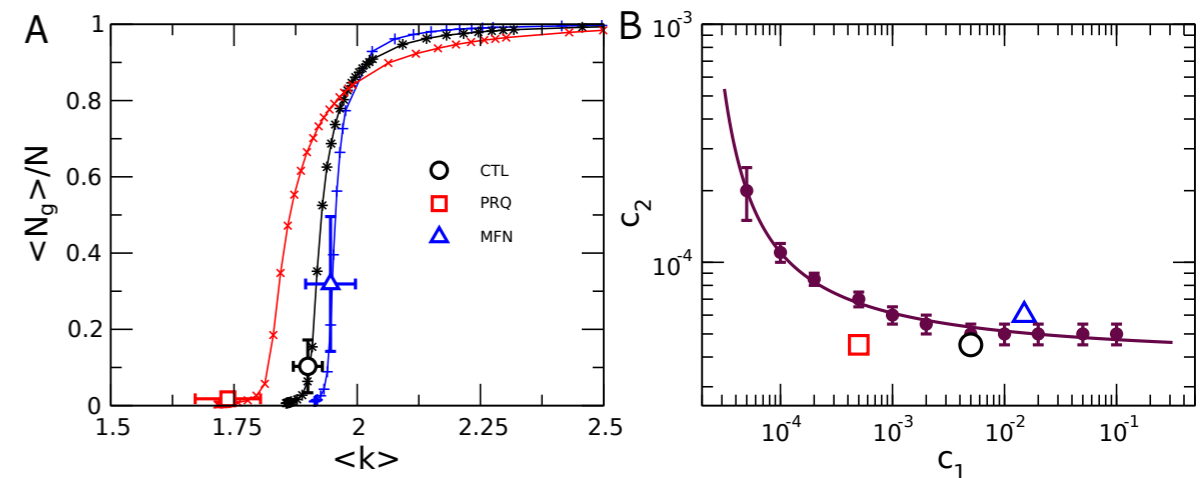


disordered

critical

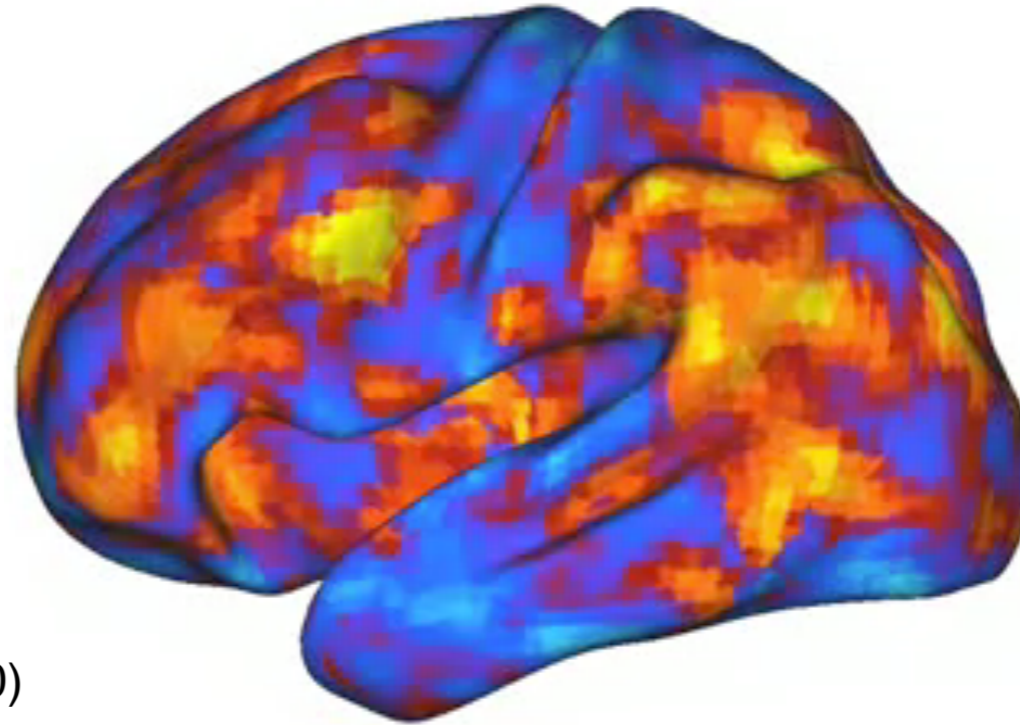
ordered

Nature Scientific Reports 8 (1), 363 (2018).



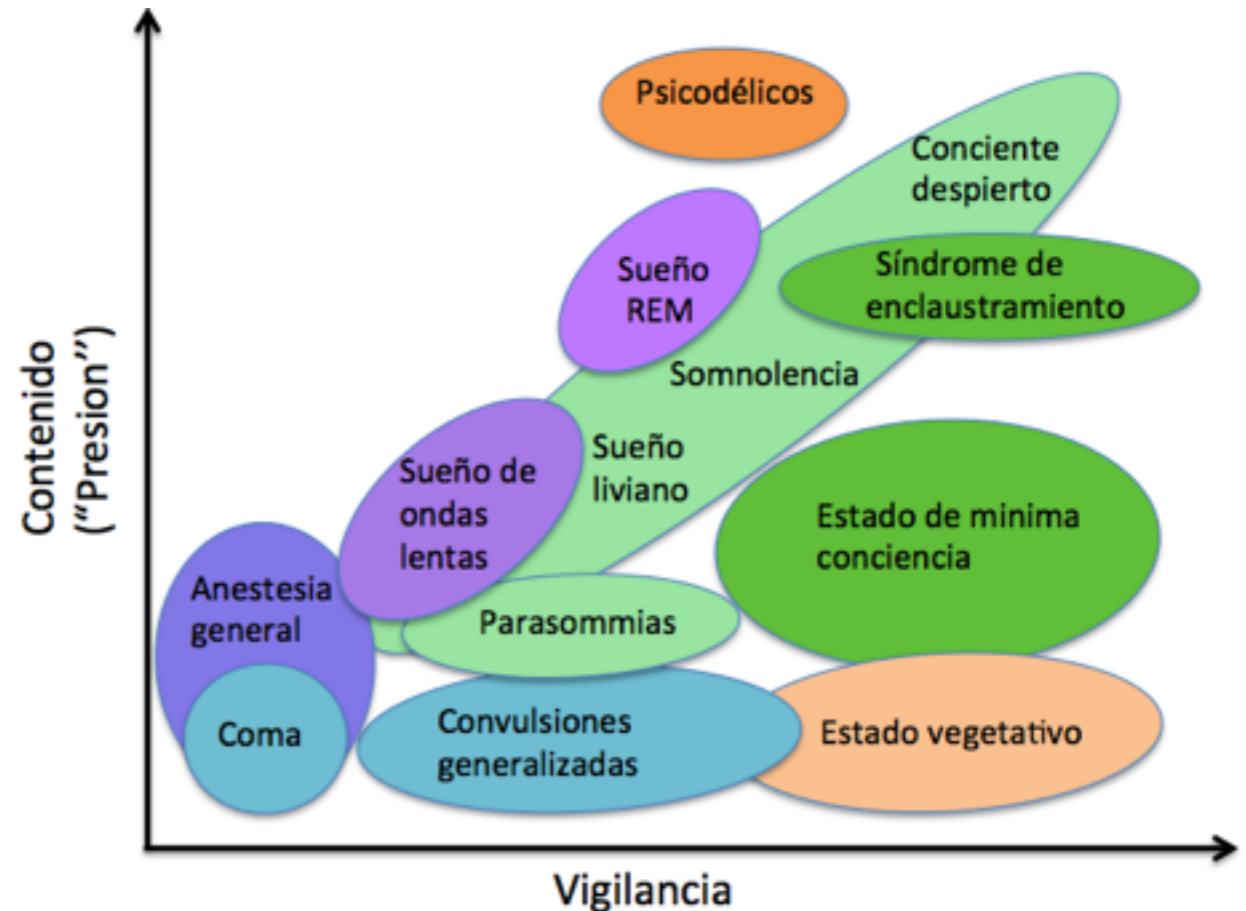
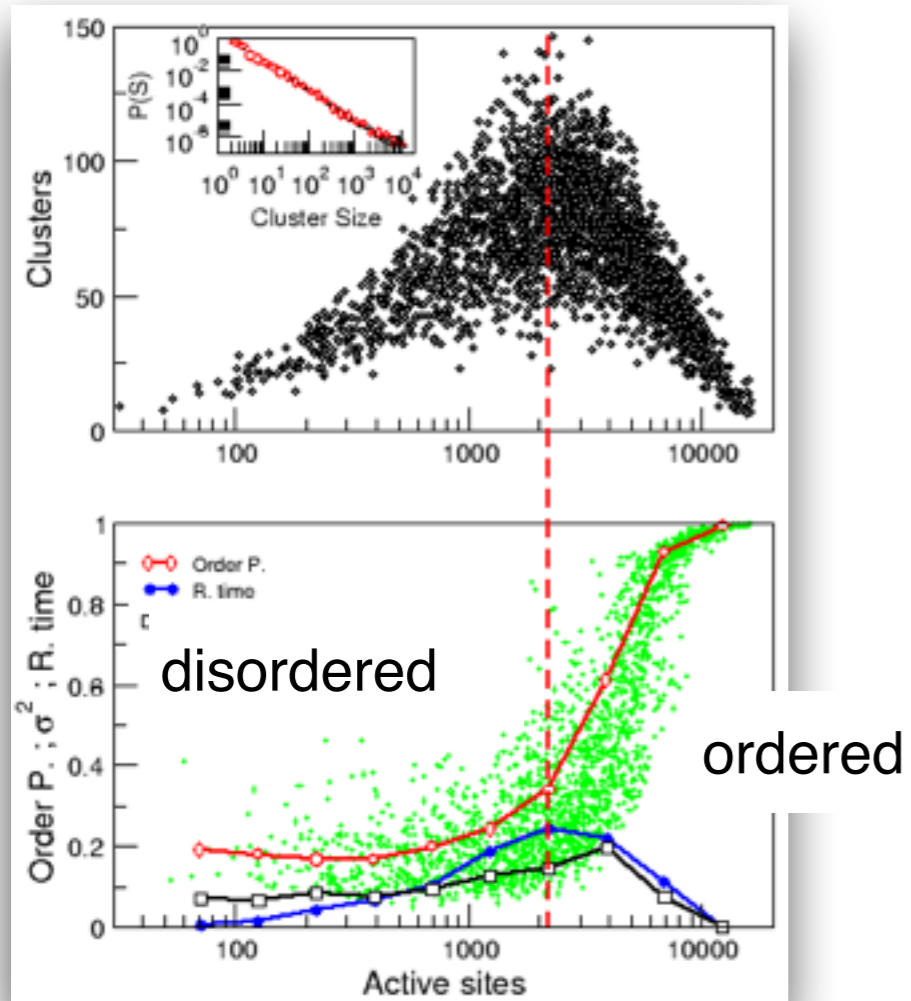
# Our lab study the complexity of “life at the edge”

Brains



Nature Physics 6 (10), 744-750 (2010)

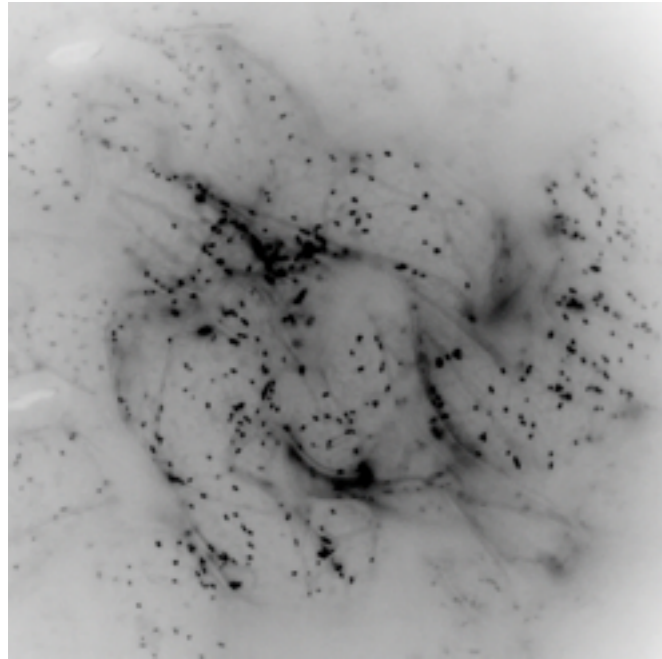
Brain fMRI dynamics



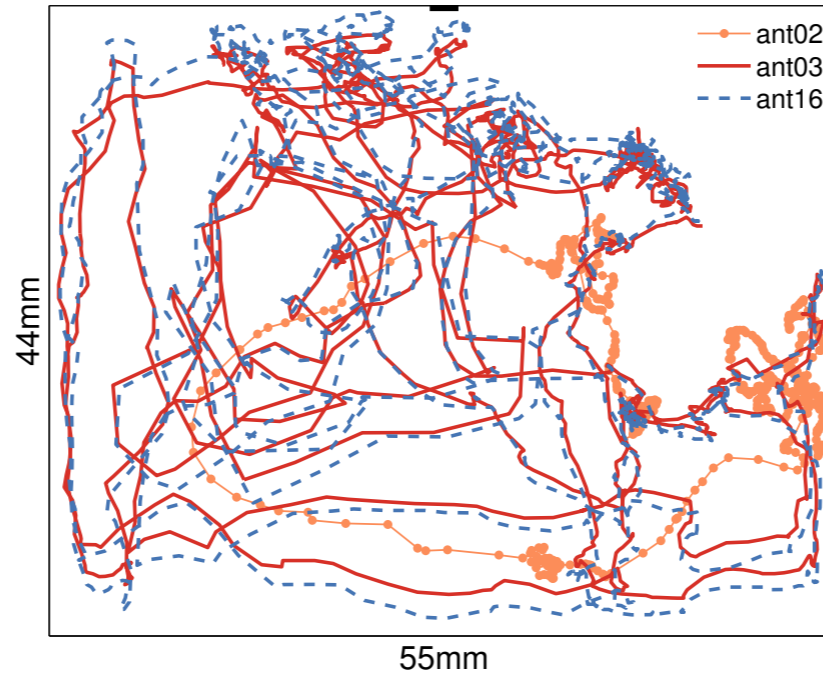


# some other systems we study with the same approach

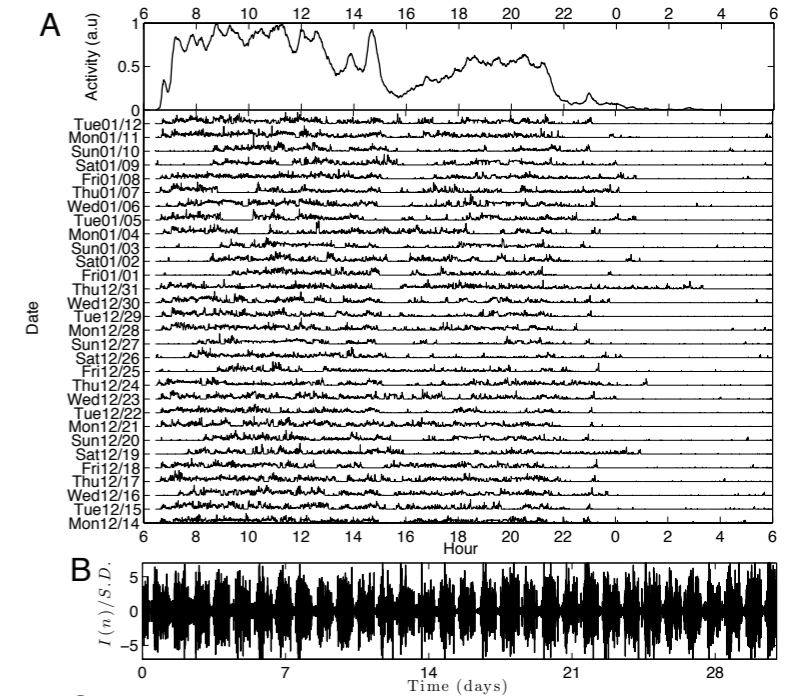
Dynamic of plants  
Mitochondria



Ants swarms



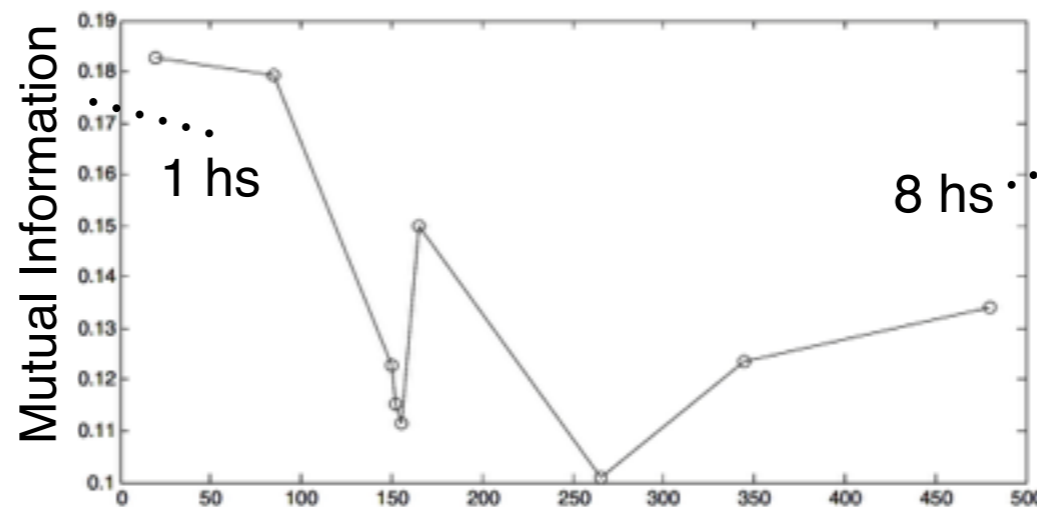
how humans move



## Paint complexity



Self\_Portrait  
after LSD





# Take-home message

disorder



order

free artistic re-interpretation

