平成 29 年 5 月 30 日　掲示

平成 29 年度　第 11 回
数理分子生命理学セミナー

日時：　平成29年7月5日（水）　14:35～16:05

場所：　理学部 E209　講義室

講師：　Oliver Steinbock　教授　（Florida State University, USA）

演題：　Self-organization and complexity: The origin of macroscopic order from microscopic processes

要旨：　Simple rules can create complex patterns and dynamics. This connection is routinely used by living systems to create complex rhythms, spatio-temporal structures, and high-performance materials with design features at meso- and macroscopic length scales that seem to defy their molecular origins. In my lecture, I will present several examples that illustrate this point and demonstrate that many phenomena that appear to be unique to life processes actually occur in non-biological, often simple chemical systems. Specifically, I will discuss nonlinear wave patterns in reaction-diffusion media and examples of life-like structures in chemical reactions that form polycrystalline or amorphous solids. The unexpectedness of some of these universalities has profound consequences in a wide range of scientific disciplines ranging from the misidentification of early microfossils to deadly cardiac arrhythmias.

References:

O. Steinbock, J. H. E. Cartwright and L. M. Barge “The Fertile Physics of Chemical Gardens” *Physics Today* **69**, March 2016.

Z. Zhang and O. Steinbock “Local Heterogeneities in Cardiac Systems Suppress Turbulence by Generating Multi-armed Rotors” *New Journal of Physics* **18**, 053018, 2016.

E. Nakouzi and O. Steinbock “Self-organization in Precipitation Reactions Far From the Equilibrium” *Science Advances* **2**, e1601144, 2016.

J. M. García-Ruiz, E. Nakouzi, E. Kotopoulou, L. Tamborrino and O. Steinbock "Biomimetic Mineral Self-organization From Silica-rich Spring Waters" *Science Advances* **3**, e1602285, 1-7, 2017.

数理分子生命理学セミナー世話人　中田　聡　（内線 7409）

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