Ken SEKIMOTO @ 839A

Memory in Material

(M2 *stage* + possibility of DC*)

*no scholarship is promised yet

Introduction

Any memory requires some material to be stocked (DVD, USB key, brain, ...)
The ultimate memory material may be a single atom, electron, photon ... (?)

Main subject

In the disordered material, what information is memorized and how ?

← Non-equilibrium statistical physics

Spin models, *Progressive Quenching* (*martingale process*) — '17 M2 stages, papers submitted

Elasto-Bingham model, the *Internal Stress* — PRL '04

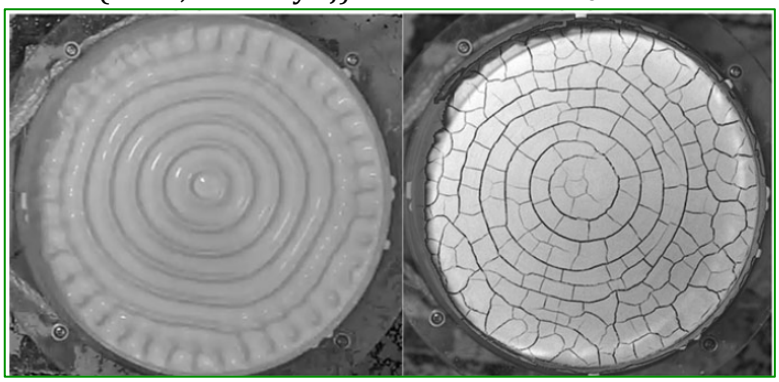
← Soft material physics

Glassy rubber, the stretching history $L(t)/L_0$ stocked in "glass modes" — PRL '02

Proposed M2 stage and thesis 2018

Modelling & numerical experiments of the yielding fluid ("mud"), where the flow history $v(t)/v_0$ is stocked in "friction"→ recalled as "drying fracture"

observation (2013, Eur. Phys.J) – material=$CaCO_3$ ± salt+water

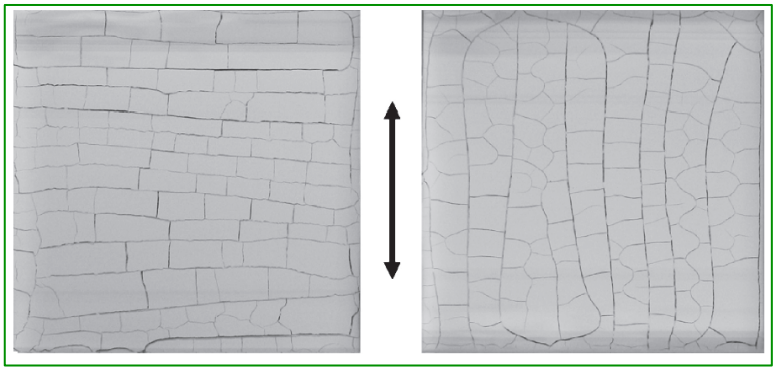


Figs. by Nakahara *etal.*

Writing — Faraday wave in *"mud"*

Reading — Spiral fracture in *solid*

☺ *"Nostalgia"* —*written in "mud" state ; remembered in solid state*



Figs. by Nakahara *etal.*

*Written on **dense** mud* — *Written on **dilute** mud*

Plan of research :

2018 Jan-Feb : "Memory in Materials" workshop @ Santa-Barbara USA (K.S. invited)

2018 spring : *M2 stage* — 2D modelling and numerical test

2018 fall + : thesis — 3D modelling, simulation, statistical-mechanical aspects*

*martingale process (see above)

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