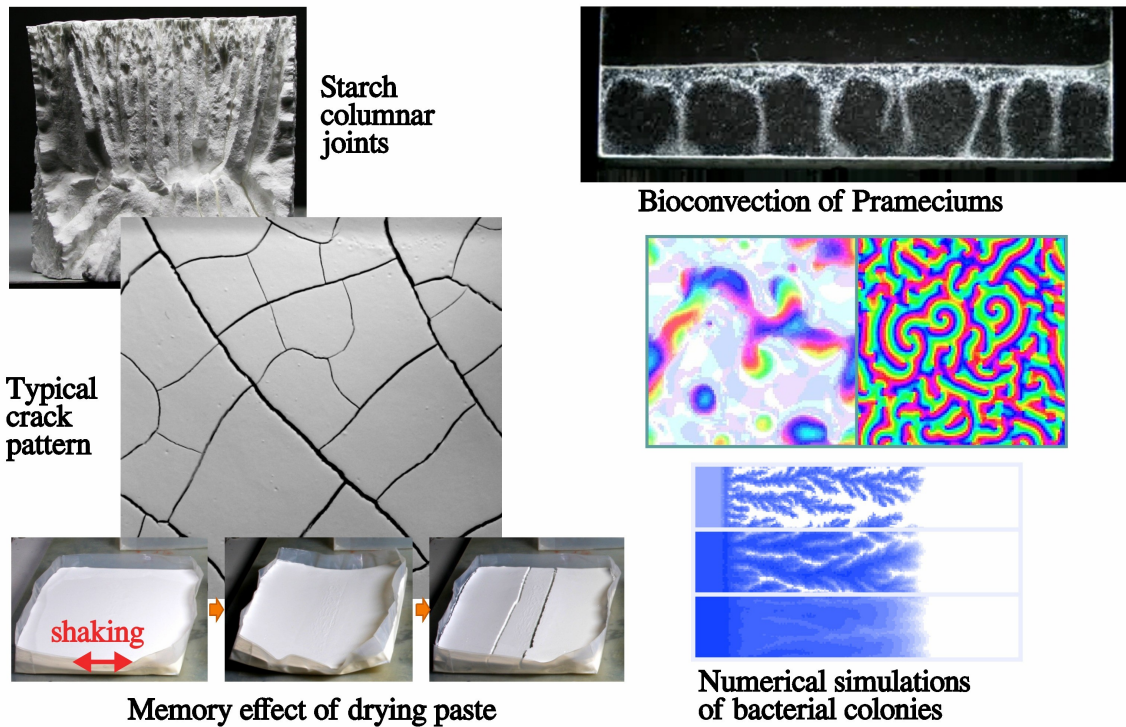


Study of deformation and fracture of soft materials, and pattern formation

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Examples of (left)fractures in pastes and (right) pattern formation of microorganisms

We are studying large deformation and fracture phenomena of soft matters experimentally and theoretically. Such phenomena are often accompanied with interactions among nonlinear elastic deformation, plastic flows, phase transition, and density changes of ingredients. Main research interests are crack formation in colloidal materials and paste-like mixtures of fine granules and liquid. Rheological properties of such materials change from liquid-like to solid-like depending on the solid volume fraction and give unique properties to crack growth processes. We are also investigating the dynamics of an assembly of simple elements, such as granular materials and microorganisms to study their spontaneous pattern formation by using mathematical models.

Keywords : Nonlinear dynamics, Pattern formation, Physics of granular matters, Rheology