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**COOLING CARAMEL ANALOG EXPERIMENTS DESIGNED TO STUDY CRACK SPACING IN LAYERED ROCKS**

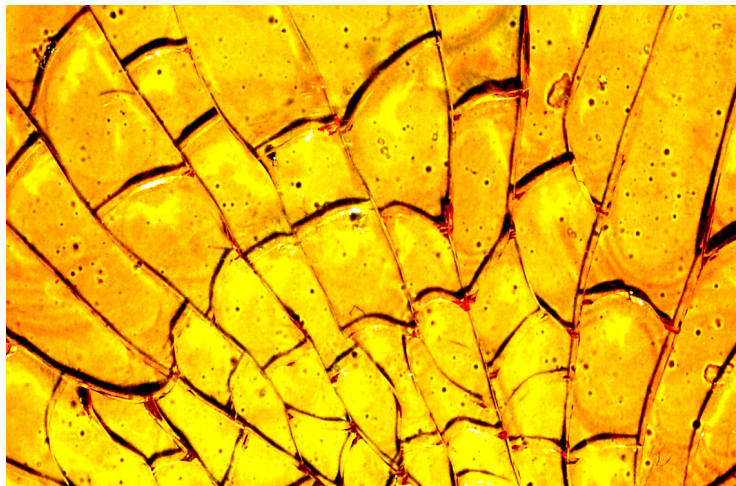
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Crack patterns are very frequent in nature, for example during the drying of mud or the cooling of a lava flow. They are present on Earth but also on other planets [1]. We can also observe cracks in layered materials, for instance in sedimentary rocks [2]. The understanding of these fractures is important notably because of its impact on the flow of groundwater or hydrocarbons or for the safety of the mines. To study the patterns observed when a layer is cooled or dried on a rigid surface, we propose analog experiments with caramel. The caramel is made by the dissolution of sugar in distilled water. This mixture is heated to 180 °C and poured in a mould placed on a glass surface. The caramel is then cooled down in a chamber where we control the humidity and impose a temperature gradient. During the cooling, crack pattern appears and we can measure the characteristic length between two fractures for a given thickness of the layer, temperature gradient in the chamber or adhesion of the surface. We then can compare these observations with results of a model which minimizes the elastic energy and the fracture energy in a thin layer [3] [4]. These results may be applied to make hypotheses on the origins of fractures observed in rocks.



**Figure 1:** Fissures in a thin layer of caramel

## References

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