ESF Exploratory Workshop on

Frontiers in European Research on
Liquid Crystalline Soft Matter

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Session ii: Drops, bubbles, tubes, foams and films

Liquids in one and two dimensions

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Thin free standing liquid crystal films and filaments represent unique objects of soft matter. They are fascinating not only from an aesthetic point of view, due to their lightness and colorfullness. Everyone of us has encountered such films, and played with them, already in early childhood, in the form of soap films, soap bubbles and foams. They play an important role in many biological and technological processes.

Early scientific studies of static and dynamic properties of such free standing films originate from 19. century. They are connected with the names of Joseph Plateau, Athanase Dupré and Lord Rayleigh, among others. We present recent experiments that investigate thin films of smectic and lyotropic liquids. The oscillations of thin liquid filaments and of bubbles, and rupture dynamics of films are studied. The experiments provide insight into processes of self organization of colloids in two dimensions, the dynamics of rupture and the aging of foams.