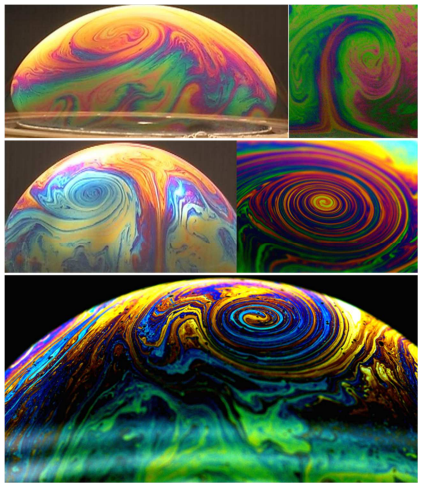
Responsable du stage:	**H. Kellay**
Laboratoire:	LOMA
Téléphone:	0540006511
Fax:	0540006970
e-mail:	hamid.kellay@u-bordeaux.fr
Durée(s) proposée(s)du stage * : 39 jours	
Sujet du stage:	1 : bulles de savon et tourbillons 2 : facteur de friction dans des écoulements bidimensionnels.

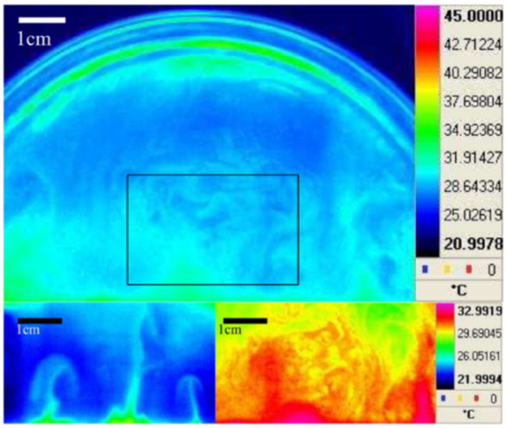
But du stage :

Our group has been very involved in and has pioneered the use of soap films and soap bubbles in experiments which tackle a variety of fluid mechanics problems. The flow in the very thin layer of these films is basically two dimensional and this property brings fundamental differences with fluid flows in three dimensions as well as experimental simplification. A few examples are: the interaction between a flow and different structures in fast flowing soap films, the measurement of viscous drag in turbulent soap film channels, and thermal convection in soap bubbles. In all these cases, the two dimensional nature of the flow allows to capture some of the key features of the underlying dynamics such as a symmetry breaking mechanism leading to locomotion of passive objects in the first case, the role of the structure of the turbulence on the scaling of the viscous drag in the second case, and the appearance of large scale vortices in the last case.

While all these problems and others are ongoing, two internships on the subject of soap bubbles subjected to thermal convection and on the friction factor of 2D channels are now open. In the first experiment, where a soap bubble is heated at its equator, a number of observations indicate that this set-up is very useful in understanding issues in vortex motion and dynamics as well as the physics of thermal convection in the turbulent state. In the laboratory, we have recently constructed a set-up where this bubble can be subjected to rotation. It is the effects of rotation on the dynamics of vortices as well as on the statistical properties of the velocity and temperature fluctuations which will be the subject of this internship. Understanding rotation effects on vortex dynamics and fluid turbulence is of utmost importance in geophysical and atmospheric sciences. In the second experiment, measurements of the velocity profiles in soap film channels will be carried out using rough walls obtained with well adapted channel walls. Here, and from the velocity profiles, the friction factor of these channels will be extracted for different Reynolds numbers. Different theories will be examined to understand the results.

The techniques to be used will be fast video imaging, fast thermal imaging using infrared cameras, as well as Laser Doppler velocimetry.





* au-delà de 40 jours, le stage devra être rémunéré