Abstract: Painting is a fluid mechanical process. The action of covering a solid surface with a layer of a viscous fluid is one of the most common human activities; virtually all man-made surfaces are painted to provide protection against the environment or simply for decoration. This process, in an industrial context, has been vastly studied and it is well understood. In case of artistic painting the purpose is different. Painters learn how to manipulate the non-uniform deposition of paint onto a surface, through lengthy empirical testing of the action and modifying the physical properties of the fluids, to create textures and patterns of aesthetic value. In this talk, an analysis of some notable painting techniques is presented from the point of view of fluid mechanics. In particular, we discuss the so-called ‘accidental painting’ technique, originally devised by David A. Siqueiros, which is the result of a Rayleigh-Taylor instability. An analysis of several techniques used by Jackson Pollock is also presented, showing how he learned to carefully control the motion of viscous filaments to create his famous abstract compositions. We also briefly discuss how pattern and textures are produced in decalcomania and watercolor painting. These investigations indicate that it is possible to establish concrete scientific discussions among modern fluid mechanics, art, art history and conservation.

Bio: Roberto Zenit received his Ph.D. from the Mechanical Engineering Department at Caltech in 1998. After a postdoctoral period at Cornell University, he moved to Mexico City in 2000 to become a faculty member at the Universidad Nacional Autónoma de México (UNAM), eventually becoming a Full Professor of Mechanical Engineering and a researcher at the Instituto de Investigaciones en Materiales, both at UNAM. He is now a Professor of Engineering at Brown University. His area of expertise is fluid mechanics; he has worked in a wide variety of subjects including multiphase and granular flows, biological flows, rheology, and more recently, the fluid mechanics of art history.