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Liquid crystalline order of carbon nanotubes GEORGI GEORGIEV, ADITYA AHLAWAT, BRIAN MULKERN, ROBERT DOYLE, JENNIFER MONGEAU, ALEX OGILVIE, Assumption College — Topological defects formed during phase transitions in liquid crystals provide a direct proof of the standard Cosmological model and are direct links to the Early Universe. On the other hand in Nanotechnology, carbon nanotubes can be manipulated and oriented directly by changing the liquid crystalline state of the nanotubes, in combination with organic liquid crystals. Currently there are no nano-assemblers, which makes the liquid crystal state of the nanotubes, one of the few ways of controlling them. We show the design of a fast and efficient polarized light ellipsometric system (a new modification of previous optical systems) that can provide fast quantitative real time measurements in two dimensions of the formation of topological defects in liquid crystals during phase transitions in lab settings. Our aim is to provide fundamental information about the formation of optically anisotropic structures in liquid crystals and the orientation of carbon nanotubes in electric field.

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