

**Art, Architecture and Innovative Fabrication Technology**

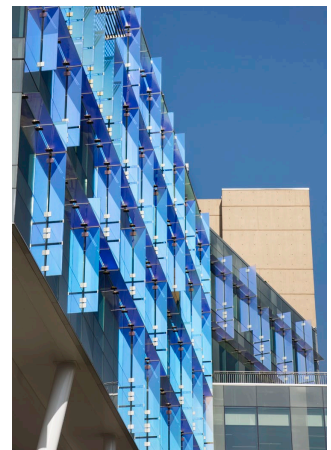
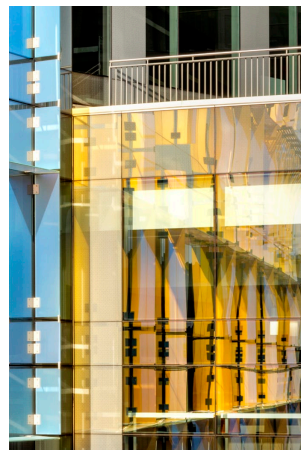
Ephemeral Light Dichroic Glass Curtain Wall Installation and Winning Competition Design  
Scott Hall the new Nano-Bio-Energy Technologies Building at Carnegie Mellon



Marc Chagall, America Windows, created expressly for The Art Institute of Chicago, 1977, 8'-0" x 32'-0"



The Lycurgus Cup, Roman, 4th c. A.D., The British Museum, h: 158.8mm



Dichroic glass transmitted/reflected light, North Wing, Scott Hall, 2018

**Inspirational Creative Artistic Sources - Methods of Nano-Fabrication**

In addition to working with SCHOTT of Germany to produce dip-coated, custom-fabricated Narima dichroic glass pieces for Scott Hall, our visual and technical research into dichroic glass nanotechnology fabrication processes took us to the 4th century A.D. with The Lycurgus Cup by Roman glass-workers and to Marc Chagall's work, as well as modern technological developments in thin film nanotechnology. The Lycurgus Cup changes color due to nanoparticles - colloidal metal-bearing materials added to molten glass - and represents one of the innovative achievements of the Roman glass industry. For Chagall's 36-colored glass installation, he drew with metallic oxide paints permanently fused to the glass with heat, a fabrication process akin to its dichroic high-tech nanoscience equivalent developed by NASA for the 1950's aerospace industry now refined for application in industries such as optics and semiconductors.