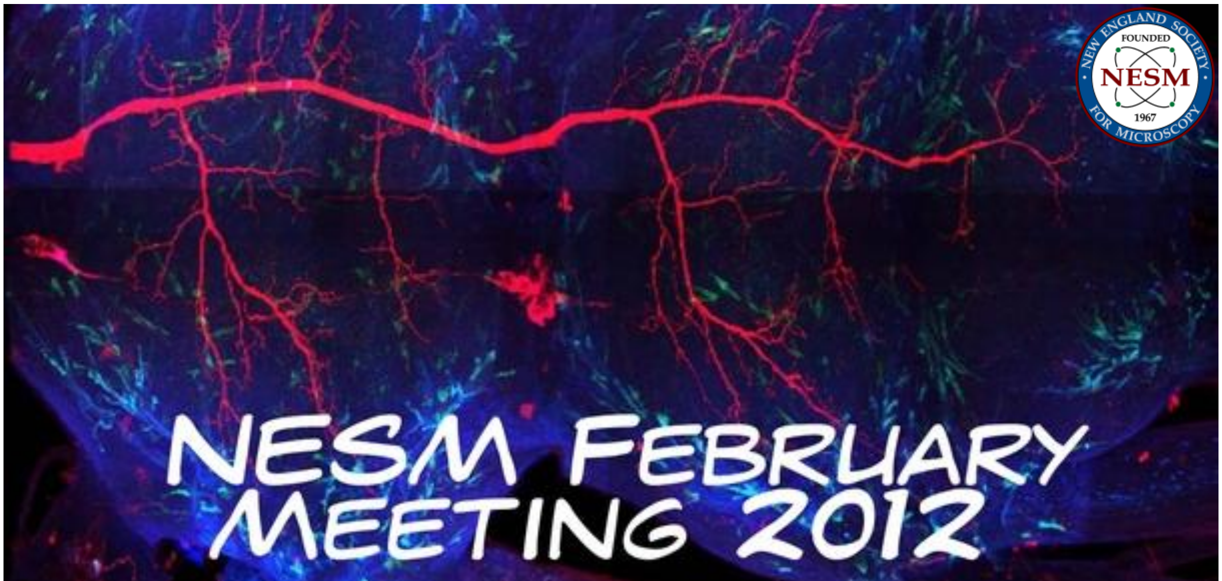

Wednesday, February 15, 2012

Saint-Gobain
Research & Development Center

Northboro, MA

Meeting Schedule:

5:30 pm **Registration & Tours:** Front Lobby

6:00 pm **Dinner:** Café

6:50 pm **Welcome:** Dr. Rakesh Kapoor, *Director of Saint-Gobain NRDC*

7:10 pm **NESM Business Meeting:** Fettah Kosar, *NESM President*

7:20 pm **"Crystals as Stacked Layers and the Infinite World of Intergrowth"**, Charles Bateman, Ph.D., Saint-Gobain, Northboro, MA

8:00 pm **"Microscopy Tools: Visual Resolution of Insect Eyes"**, Paloma Gonzalez-Bellido, Ph.D., Marine Biological Laboratory, Woods Hole, MA

8:40 pm **Closing Remarks:** Fettah Kosar, *NESM President*

NESM Feb. Meeting 2012

Talks & Bios

7:20 pm – **Crystals as Stacked Layers and the Infinite World of Intergrowth**

Dr. Charles Bateman, Saint-Gobain

Abstract:
Materials scientists are taught that face centered cubic and hexagonal close packed crystals are made up by stacking layers in different sequences. However, these two perfect structures are simply the end members of an infinite series of materials that have intergrowth structures. A number of different zeolite systems will be presented and methods to understand and describe their structures discussed.

Bio:
Dr. Charles Bateman obtained his Ph.D. from Lehigh University in Materials Science before working for Union Carbide and UOP on the microscopy of zeolitic materials. He has been with Saint-Gobain for fifteen years and is currently a group leader responsible for microstructural analysis.

8:00 pm – **Microscopy Tools: Visual Resolution of Insect Eyes**

Dr. Paloma Gonzalez-Bellido, Marine Biological Laboratory

Abstract:
The compound eyes of insects have a lens for each photoreceptor unit. Thus, for an insect to obtain high visual resolution, the number of lenses must increase, resulting in a large eye. Large eyes are energetically costly and heavy, so a large body is needed to carry them. For these reasons, the prevailing dogma states that only large insects, with large eyes, can excel as visual predators (e.g. dragonflies). I have used electron microscopy to image the early visual systems of fruit flies and killer flies. The results concur with the intracellular electrophysiology data, confirming that the visual system of small insects can also be adapted to afford a predatory lifestyle.

Seeing a potential prey is only the beginning. For a successful attack, a predatory insect must process and relay visual information to the wings in a timely and efficient manner. I have impaled and dye injected the cells that carry information about the direction and position of a small target from the brain to the wings in the dragonfly *L. luctuosa*. I have used confocal microscopy to build a 3D atlas of such cells in the pre-motor centers for the wings. The results will be discussed.

Bio:
Dr. Paloma Gonzalez-Bellido is a postdoctoral scientist working in the Hanlon Lab at the Marine Biological Laboratory. Dr. Gonzalez-Bellido, a native of Spain, attended the University of Queensland in Australia where she completed her undergraduate research project on Teleost fish retinas, leading to an interest in sensory ecology. Next, Dr. Gonzalez-Bellido completed her PhD at the University of Sheffield where she studied the electrical properties and spatial characteristics of the fruit fly retina. For comparative purposes, she examined the visual system of a fruit fly predator, the killer fly. After completing her Ph.D. she took on a postdoctoral position at Janelia Farm, a Howard Hughes Medical Institute research campus, where she studied the neural basis of predation in dragonflies. In her current post at the MBL, she has initiated investigations on the neural underpinnings of camouflage and the local sensing and motor output of the neural network on the cephalopod skin.