



NEWS from NIGHTSEA
Contact: Dr. Charles Mazel, President
P: +1(781)791-9508
E: nightsea@nightsea.com

NIGHTSEA's fluorescence technologies excite new worlds in all levels of science education

Imagine looking at a rock, a fish, or a bug under normal lighting then, at the flip of a switch, uncovering a hidden world of science, glowing in dramatic greens, reds and yellows. Schools and science centers around the world are using the exciting technology of fluorescence to discover that hidden world, providing unique investigative insights and engaging children and students at all levels.

Solutions that grow

Fluorescence is the simple process of using light of a specific energy or wavelength to excite electrons in a material or organism, resulting in the emission of light of a different energy or wavelength. For youngsters who don't yet have the coordination to look through a microscope, NIGHTSEA's BlueStar flashlights and matching space-age goggles (Figure 1) reveal inclusions in rocks, special genetics in fly larvae, and secret structures on coral and small sea creatures from a tidal pool.

For students from upper grade-school to undergraduates and graduate level, NIGHTSEA's Stereomicroscope Fluorescence Adapter (SFA, Figure 2) easily adds a powerful fluorescence capability to existing routine stereo microscopes. Until the SFA, stereo fluorescence microscopy has been off limits to these students because of the complexity and high cost of a research fluorescence stereo (often on the order of \$50,000). With the SFA, any student capable of looking through a microscope can conduct a wide range of fluorescence experiments. For example, students at Colgate University's Developmental Biology Lab were interested in how various drugs affected the growth of the nervous system and vasculature in zebrafish embryos. By tagging those systems in transgenic zebrafish with Green Fluorescent Protein (GFP) and observing them under a routine stereo microscope fitted with the SFA, they could observe changes in those specific structures as the fish developed.

SFAs expand opportunities for applications ranging from fluorescence-guided dissection and injection to micromanipulation. In genetic studies, SFAs help screen and sort fluorescently tagged seeds, frog (*Xenopus*) or fly (*Drosophila*) larvae, or the nematode, *C. elegans*. In geology, they reveal hidden information used to characterize rocks and minerals, and in industry, to detect defects in a wide range of applications.

Transforming a seaside jaunt, a local gym or cafeteria into powerful local learning centers

Fluorescence isn't reserved just for the classroom. Using the NIGHTSEA Eclipse MicroTent to provide portable, on-demand darkness and a simple battery supply, the SFA leaves the lab for the field, whether it be a geology expedition to a roadside rock outcrop or a tidal pool on the rocky coast of Maine. Because they are robust, compact and easy to use, both the BlueStar flashlight kits and the SFA are also used for community outreach. For example, the University of Montana uses both technologies in their spectrUM Discovery Center in downtown Missoula, Montana, and as part of MosSE, their traveling science experience. To date, MosSE has worked with over 27 schools in half of Montana's counties and all of the Native American reservations.

NIGHTSEA's fluorescence solutions for the laboratory are now being used in over 700 research and educational institutions in nearly 50 countries around the world.

For further information on how NIGHTSEA technology is being used in education, visit

<http://www.nightsea.com/articles/fluorescence-in-education/>

And, for more about the University of Montana's spectrUM Science Center and community outreach, download the application note at <http://bit.ly/spectrUM-appnote>

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Images attached

Caption, Figure 1. a. At the spectrUM Science Center (Missoula, MT), NIGHTSEA's BlueStar Flashlights and matching goggles reveal the hidden world of genetics for younger children. b. Fly larvae viewed with normal "white" light c. Genetically modified larvae revealed using fluorescence

Caption, Figure 2. NIGHTSEA's Stereo Microscope Fluorescence Adapters easily and economically adapt existing stereo microscopes to fluorescence

About NIGHTSEA

NIGHTSEA creates and manufactures elegantly simple new technology to reveal the hidden spectral dimension of fluorescence in the lab, underwater, and in the world around us. Inventor and President, Dr. Charles ("Charlie") Mazel is an expert deep sea diver, marine biologist, and entrepreneur. Visiting NIGHTSEA.com is a visual treat as well as scientifically intriguing, "bringing fluorescence to light."