April 15, 2009—It's not every day that the words "glowing" and "mucus" are mentioned in the same breath, but here's one such sentence: a seafloor-dwelling fireworm that's long fascinated sailors by oozing glowing green mucus into the sea has finally been put under the microscope.

The female marine fireworm, *Odontosyllis phosphorea*, releases bioluminescent secretions synchronized with the moon's phases to entice mates.

A day or two before each summertime quarter-moon phase, 30-40 minutes after sunset, the females expel glowing mucus and some eggs. Enticed by the light, the males also contribute gametes to the X-Files-esque reproductive cloud. The whole endeavor lasts for about 20-30 minutes, and is remarkable for its precise timing.

But the new study of the worms by scientists from the Scripps Institution of Oceanography has revealed another luminous surprise: juvenile *Phosphorea* are now also believed to exude "flashes" of the signature goo, perhaps to startle predators.
Above, the marine fireworm is seen in its non-exuding state.

The animal has four eyes, colored red in the picture, which are sensitive to the unique bioluminescent expulsions of marine fireworms.

Among the many intriguing aspects of the marine fireworm is the staying power of the glow it creates, thought to be created by a specific light-producing protein, or "photoprotein." As part of the Scripps study of the worms, it was found by researchers Dimitri Deheyn and Michael Latz that the goo glows in temperatures as low as -20 degrees Celsius (-4 degrees Fahrenheit).

The fluorescent photoprotein in the worm's goo may have commercial applications. "If we understand how it's possible to keep light so stable for such a long time, [the process could be used] in biomedical, bioengineering, or other fields," Deheyn said in a statement.

--Chris Combs
Photograph by Dimitri Deheyn, Scripps Institution of Oceanography