



**The French National Firefly Observatory,  
Flaugergues' bioluminescent earthworm  
&  
"Absence" of natural fluorescence in Arctic waters**

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In 2015 we founded the **French National Firefly and Glowworm Observatory**, a citizen science project that asks the general public to help the scientific community to know in which regions of France these animals are thriving. The creation of this observatory through a novel approach and first results of the many thousands of observations (18000 in 2017) will be presented. We are also trying to use a similar approach in Italy, Spain and Romania.

Amongst the about 7000 known **earthworm** species, thus far only 40 are reported to produce light. A short review will be presented about the **bioluminescence** of these interesting animals and hypotheses concerning the function of producing underground light will be discussed and illustrated with some preliminary data obtained on Flaugergues' worm that we recently re-discovered in the French Loire valley after 250 years of absence from the scientific literature. Isolation of the luciferase and luciferin of this animal will provide new **imaging tools** for cell biology, medicine and industry.

Recently the UTPIII expedition (<https://www.underthepole.com/>) deep-dived down to -100m the waters of the North-Ouest Passage between Greenland via Canada to the south of Alaska. Organisms were collected and verified for **natural fluorescence** and **bioluminescence**. The hypothesis that these dark and cold waters are not favorable for fluorescent signal communication seems true. Preliminary results will be shown. Extraction and characterization of the fluors could again provide new **imaging tools**.