



# REINFORCE

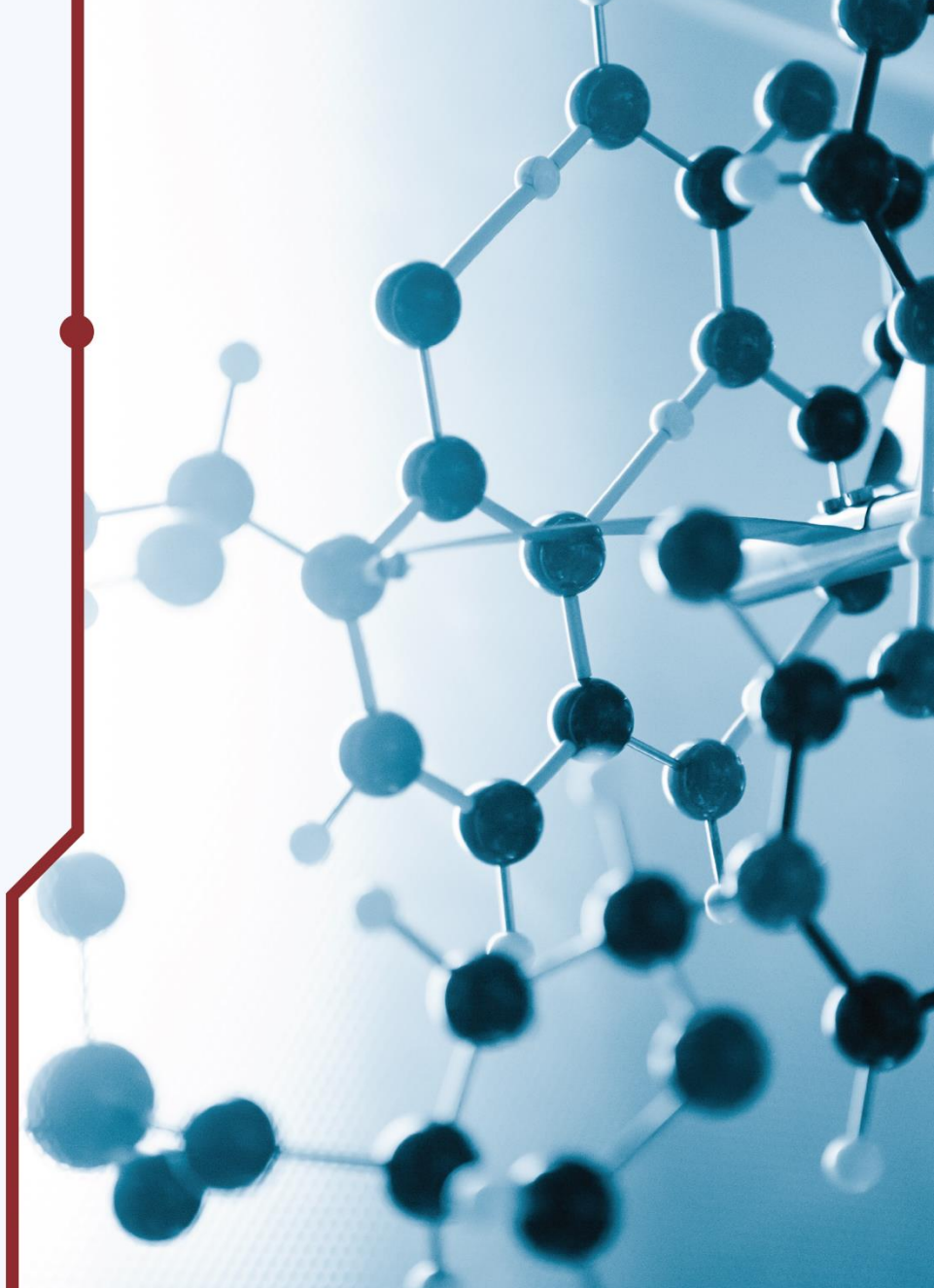
REsearch INfrastructures FOR Citizens in Europe

## BIOLUMINESCENCE in the ocean

WEBINAR

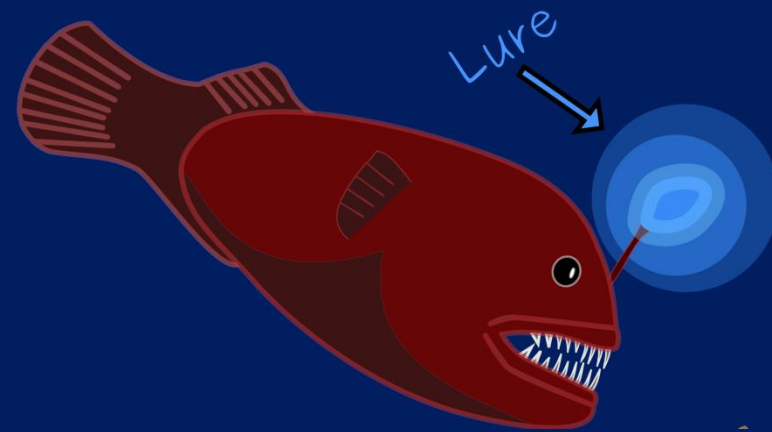
February 26, 2021, 15:00 CET

**MARTINI Séverine,**  
Mediterranean Institute of Oceanography



# BIOLUMINESCENCE: light emitted by living organisms

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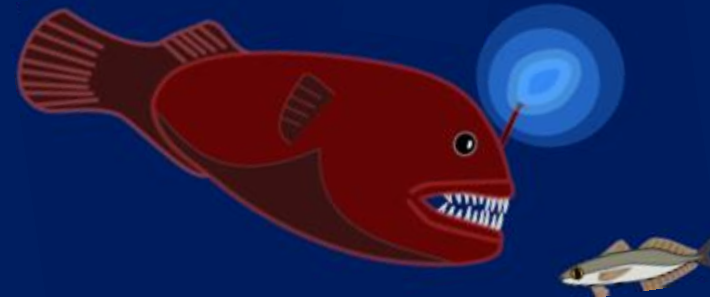
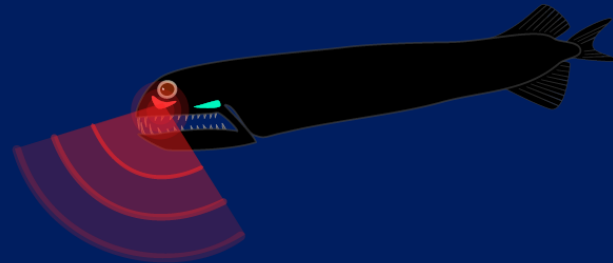
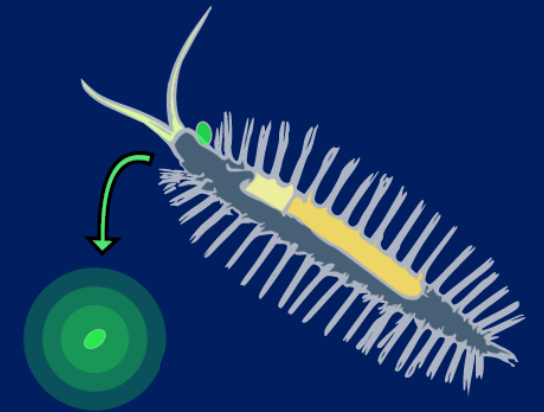
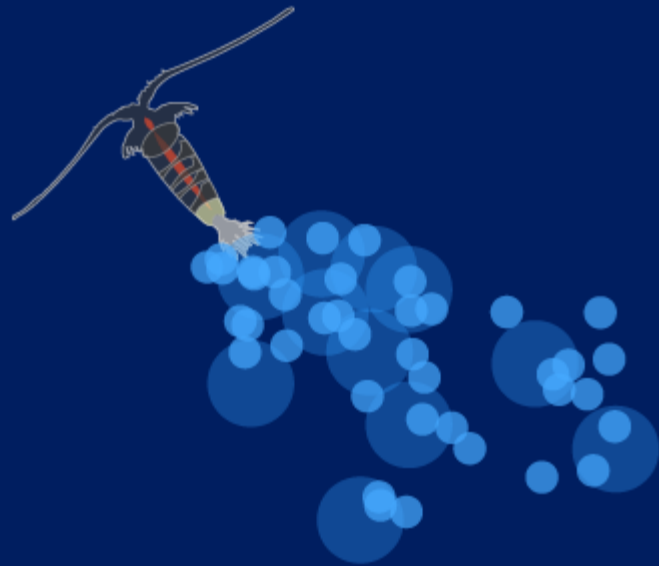
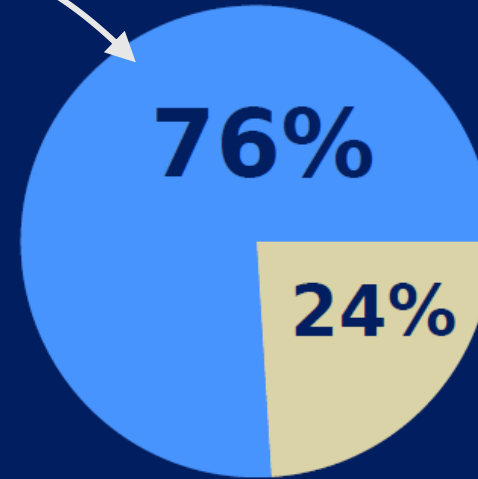
# BIOLUMINESCENCE: light emitted by living organisms



Illustrations credits: W. Francis

# PELAGIC organisms: in the water column

**Bioluminescent**



Illustrations credits: W. Francis

# PELAGIC organisms: in the water column

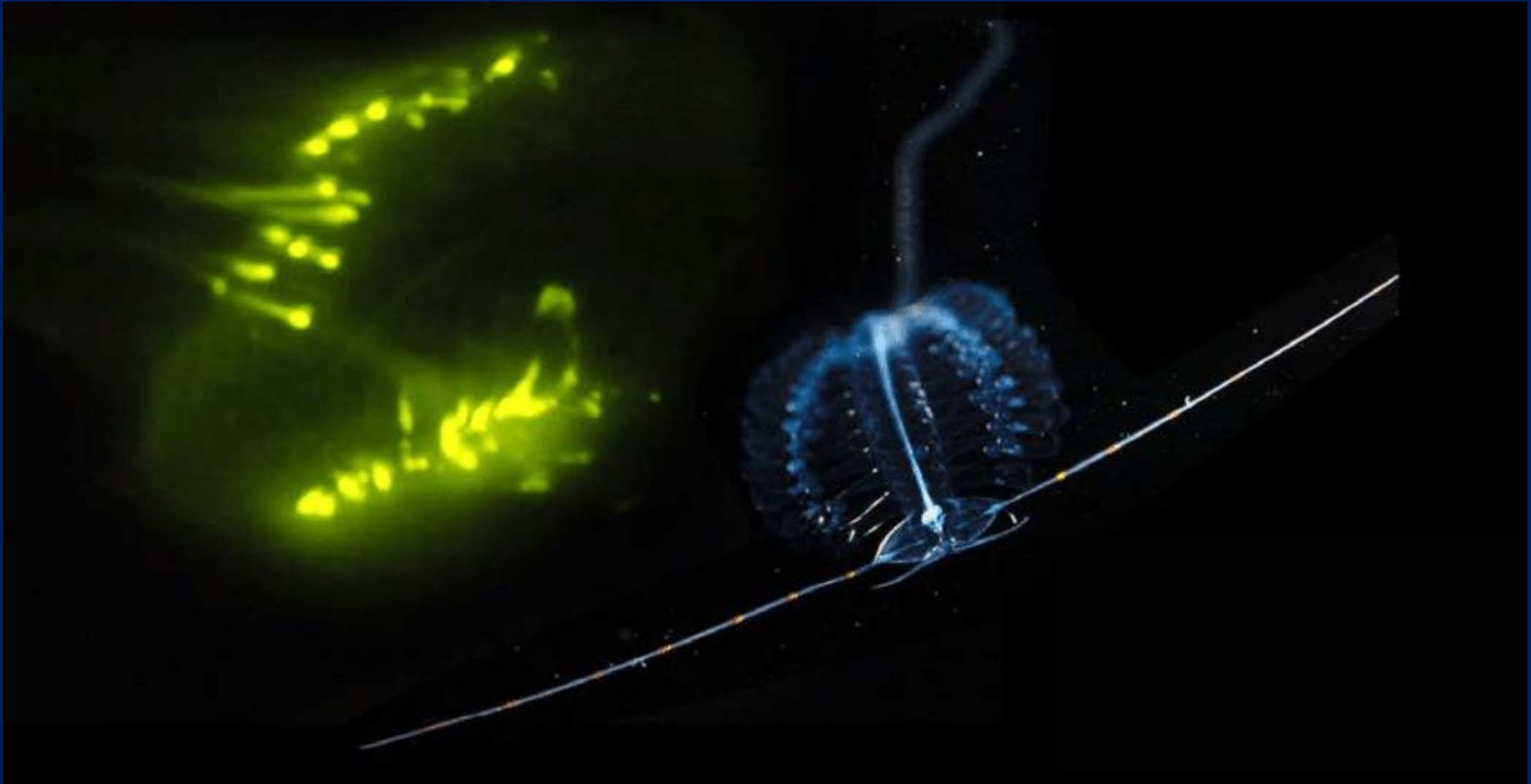
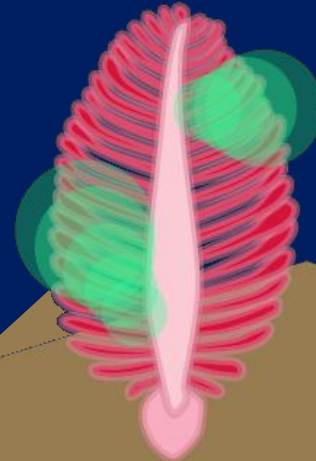
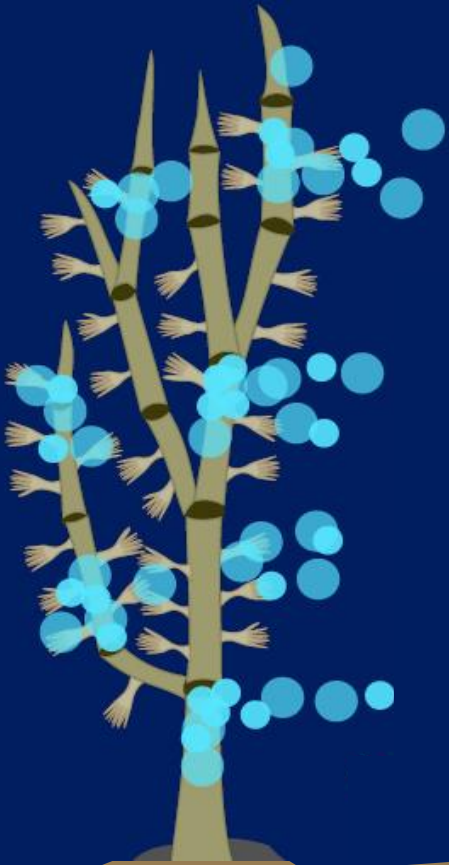
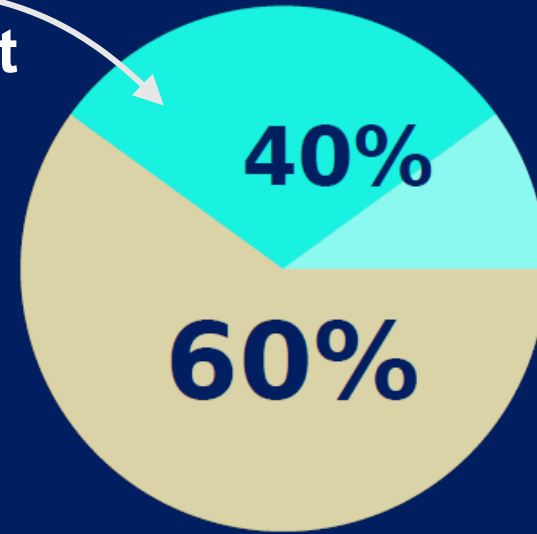


Photo by Steven Haddock

# BENTHIC organisms: close to the seafloor

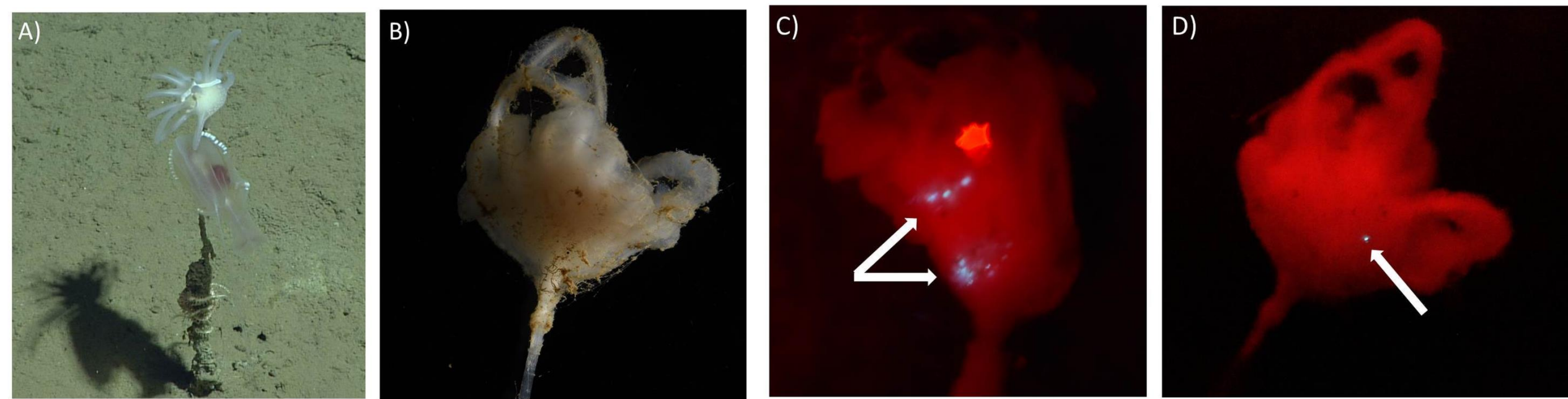
Bioluminescent



Illustrations credits: W. Francis



# BENTHIC organisms: close to the seafloor

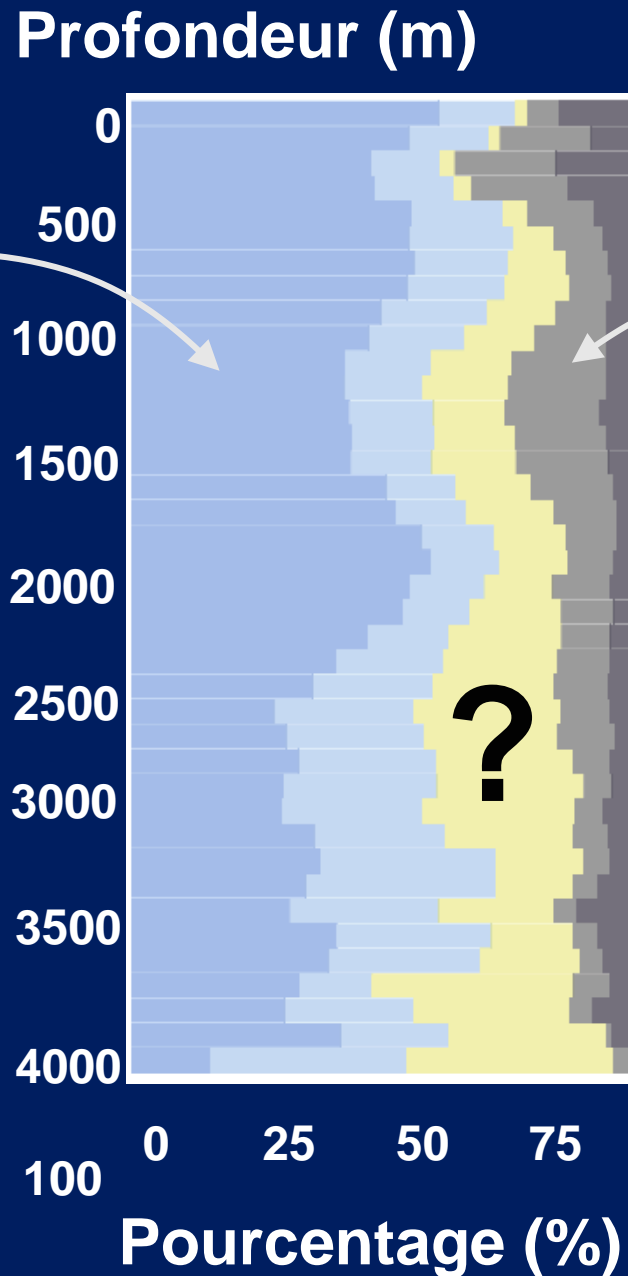


Martini et al., 2020



# A common trait in the ocean

Bioluminescent



Non-bioluminescent

- ✓ “Undefined” below 500m depth
- ✓ Low variability in the water column

**WE STILL HAVE A LOT TO LEARN FROM THE DEEP OCEAN !**

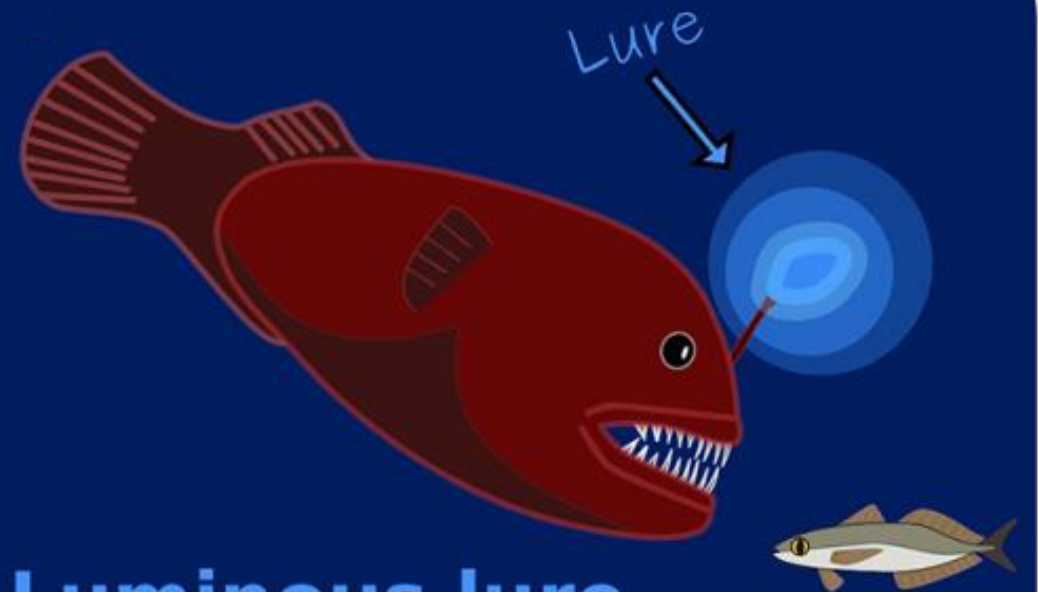
Martini, and Haddock, 2017

# Several ecological roles

✓ Defense, Offense, Find a partner

## Smoke screen

This copepod makes a cloud of blue light to blind a predator while it escapes.

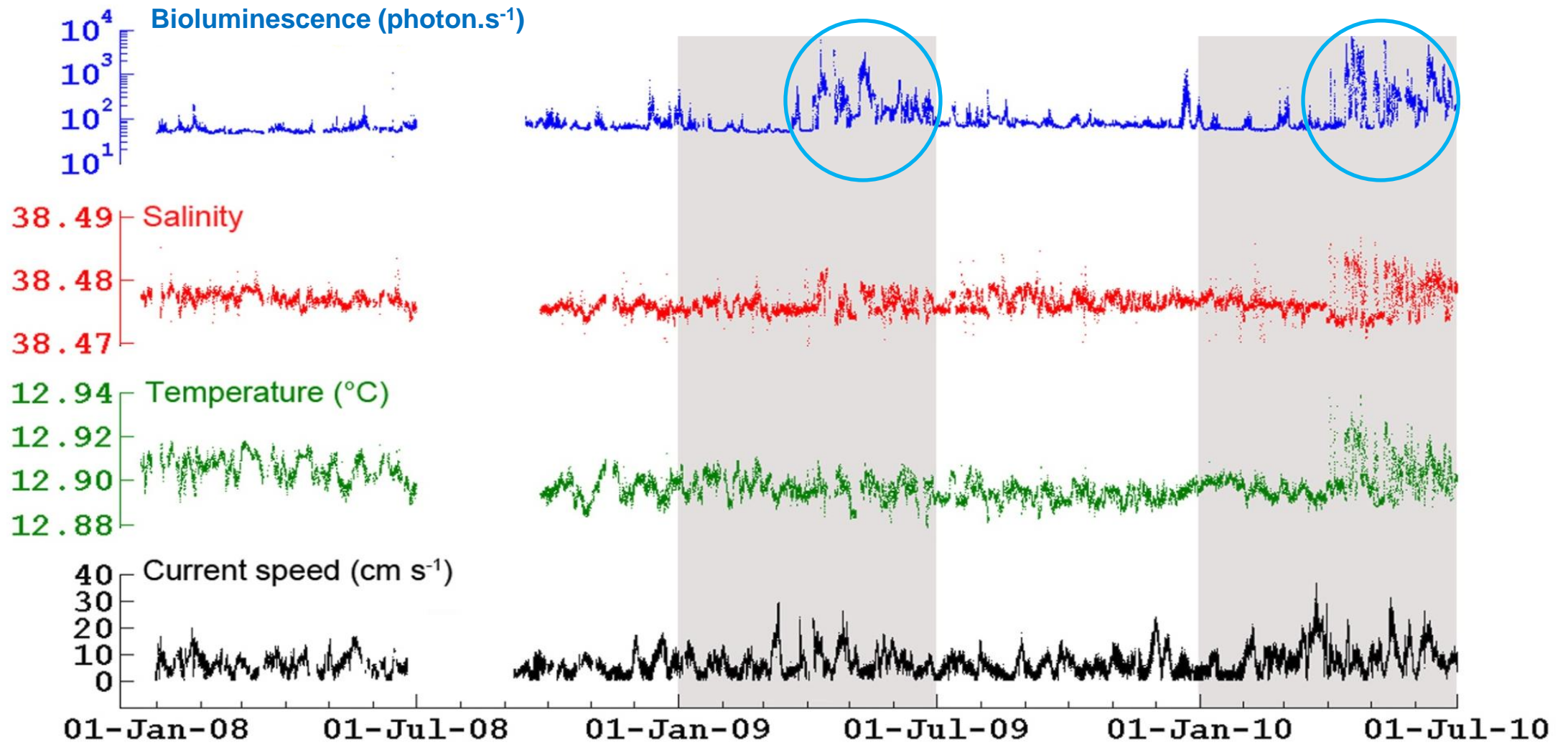


## Luminous lure

The anglerfish has a lure full of symbiotic, glowing bacteria. Small prey approach the lure, and get eaten.

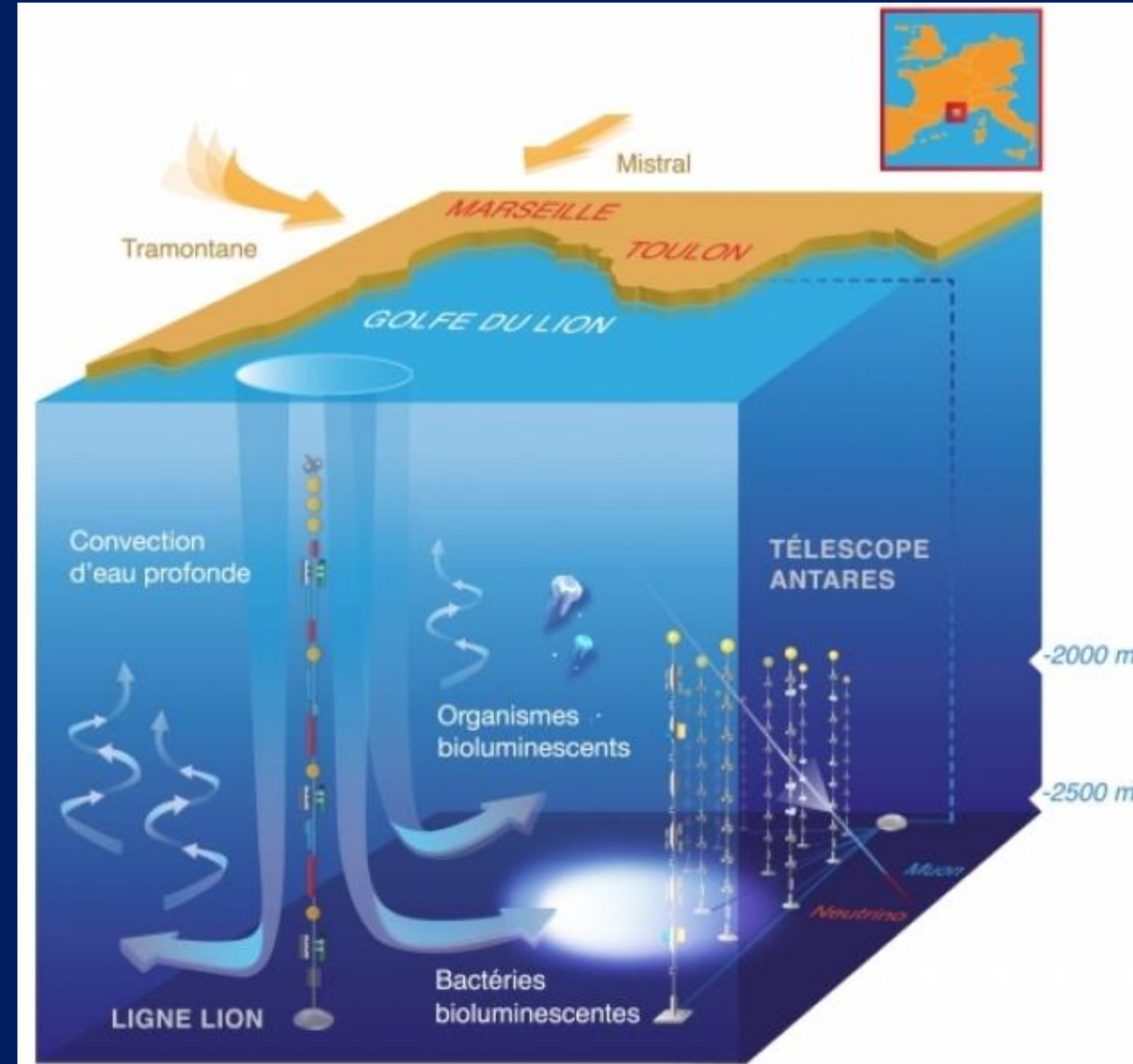
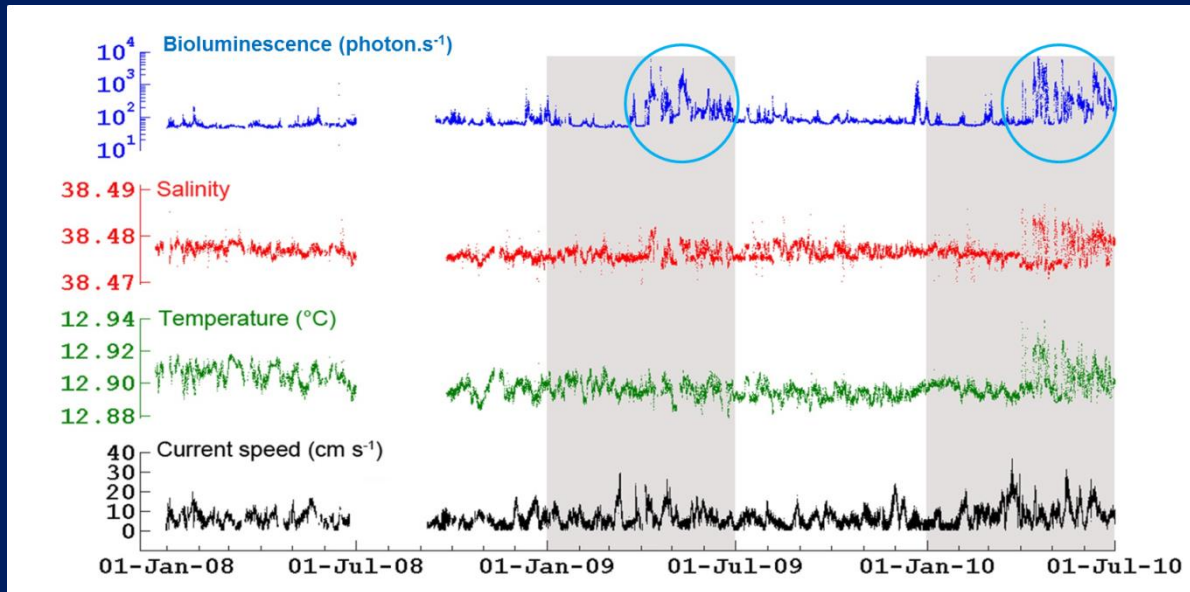
Martini, and Francis, 2020

# Bioluminescence in the Mediterranean Sea



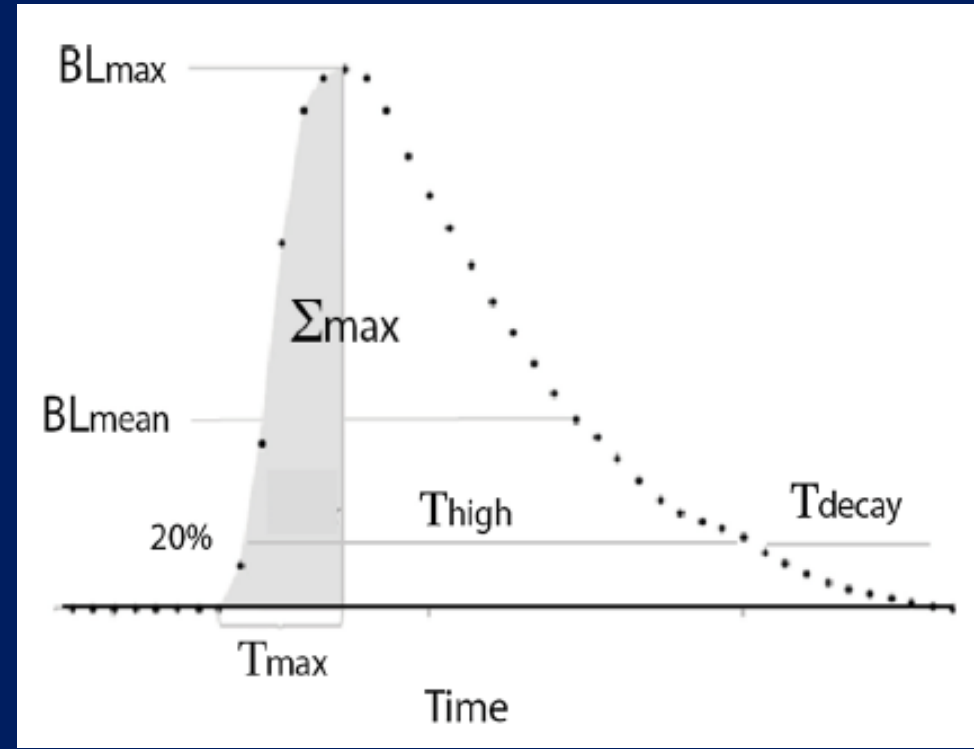
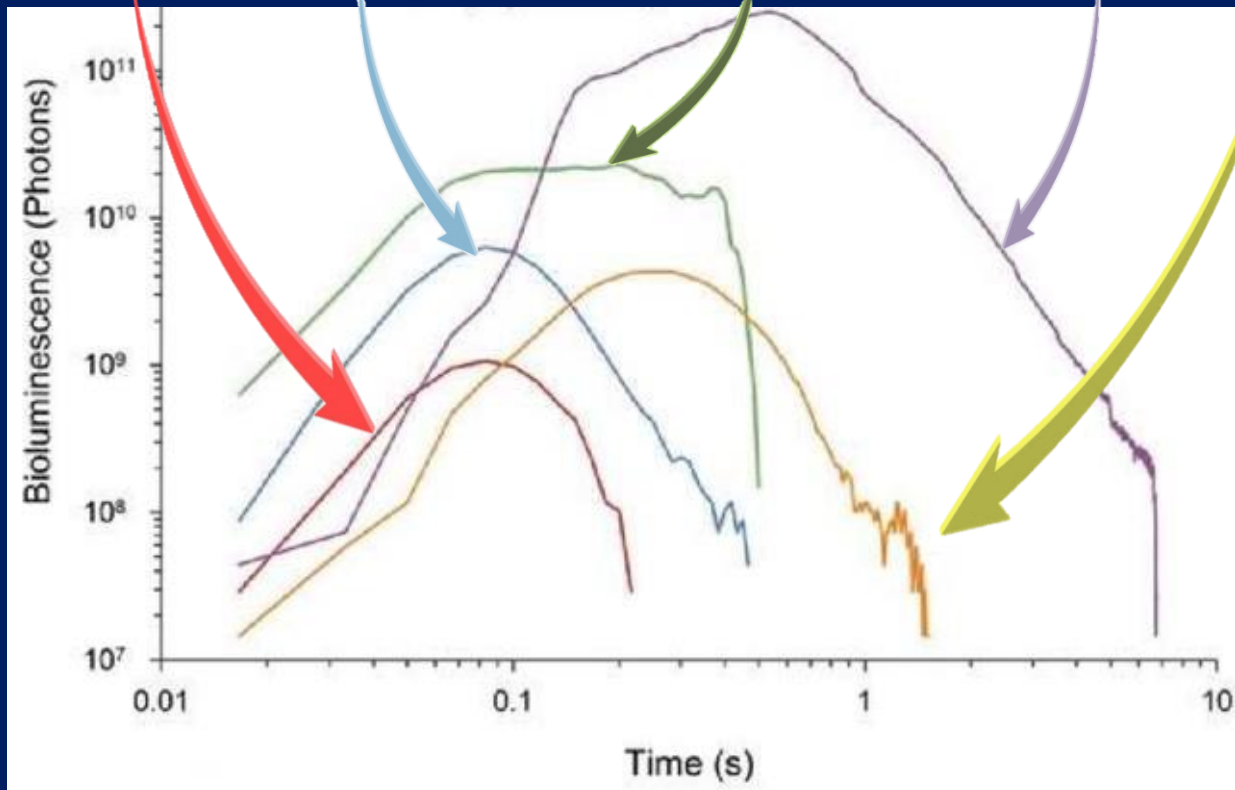
Tamburini et al., 2013

# Bioluminescence in the Mediterranean Sea





# From the literature, various patterns of light



Johnsen et al., 2014  
Cohen et al., 2020

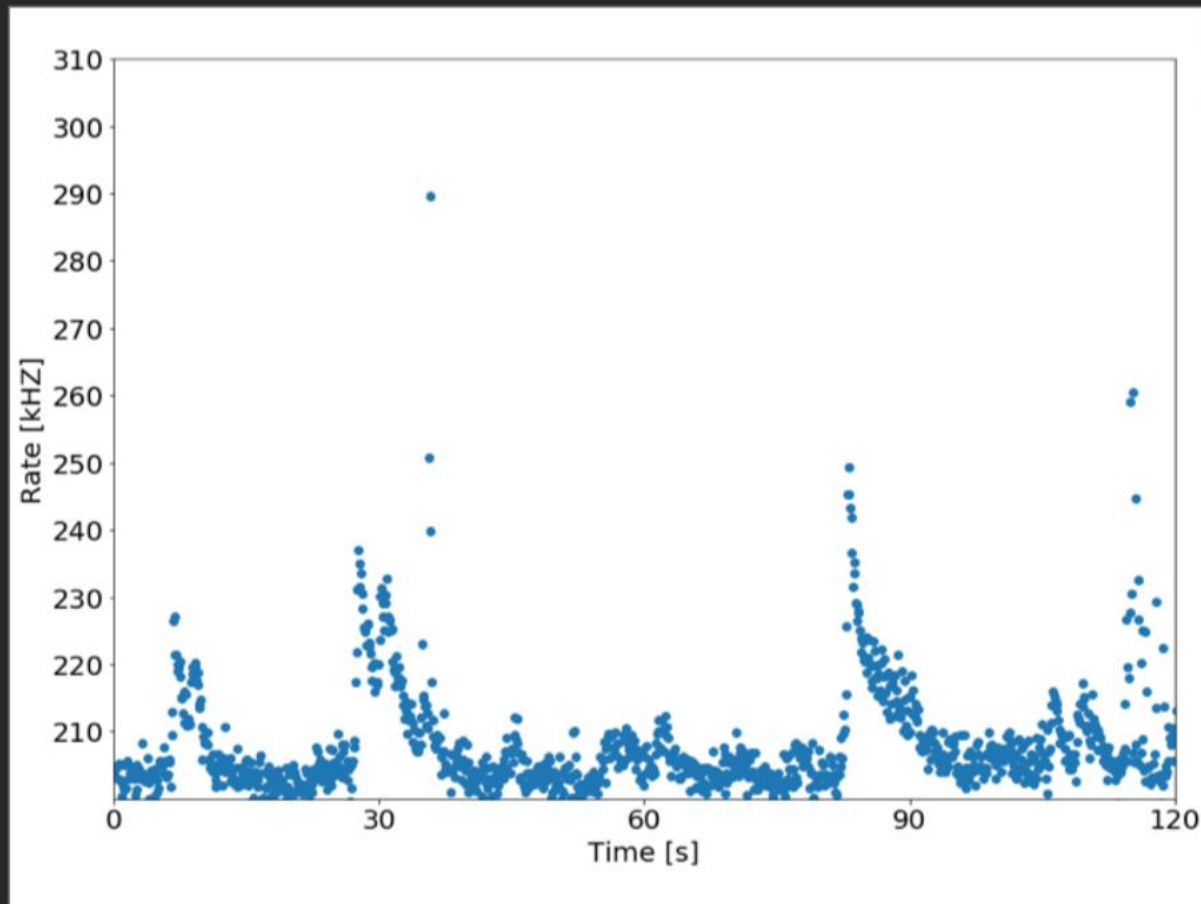
# For the next steps we need your help !



Deep Sea Hunters

ABOUT

CLASSIFY



TASK

TUTORIAL

What is the classification of this event?

One peak

Two peaks

Multiple peaks


Weird

Done



# To learn more about bioluminescence...

See our paper  
in *Frontiers for Young Minds*



## Scientific publications

- ❏ Martini S., Kuhn L., Mallefet J., Haddock S.H.D., Distribution and quantification of bioluminescence as an ecological trait in the deep sea benthos, *Scientific Reports*. 9(1) 1-11.
- ❏ Cohen, J. H., J. Berge, M. A. Moline, G. Johnsen, and A. P. Zolich. 2020. Light in the Polar Night, p. 37–66. *In* J. Berge, G. Johnsen, and J.H. Cohen [eds.], *POLAR NIGHT Marine Ecology: Life and Light in the Dead of Night*. Springer International Publishing.
- ❏ Johnsen, G., Candeloro, M., Berge, J. *et al.* Glowing in the dark: discriminating patterns of bioluminescence from different taxa during the Arctic polar night. *Polar Biol* **37**, 707–713 (2014).
- ❏ Martini, S., & Haddock, S. H. (2017). Quantification of bioluminescence from the surface to the deep sea demonstrates its predominance as an ecological trait. *Scientific reports*, 7(1), 1-11.
- ❏ Tamburini C., Escoffier S., Canals M., Durieu de Madron X., Houpert L., Lefèvre D., Martini S., D’Ortenzio F. and the ANTARES collaboration, 2013. Deep-sea bioluminescence blooms after dense water formation at the ocean surface. *PLoS ONE* 8 (7), e67523



# REINFORCE

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