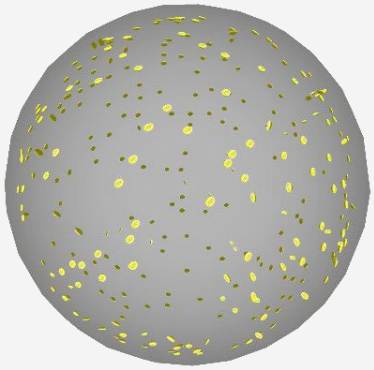
PlanktoQuest

an immersive voyage inside marine plankton

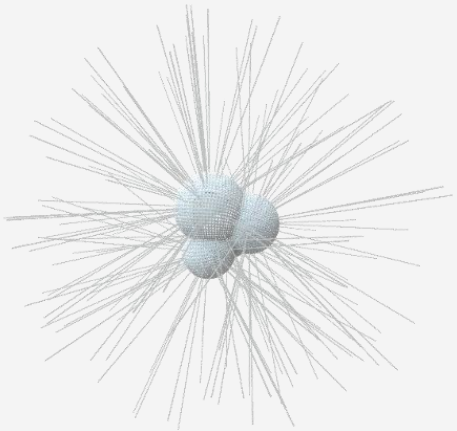
Scale: **MESO**



Phaeocystis

Lineage : Haptophytes
Scale : 200 to 500 microns

Characteristics : *Phaeocystis* is one of the most abundant microalgae in the oceans, especially in coastal areas. It can proliferate in high numbers (forming “blooms”) with harmful effects on marine life. It can form large colonies made of a gelatinous matrix like a marshmallow candy.



Globigerina

Lineage : Foraminifera
Scale : 200 to 300 microns

Characteristics : *Globigerina* is able to capture on different prey (predation) but can also photosynthesize thanks to its symbiotic microalgae living inside. The mineral skeleton of *Foraminifera* in calcium carbonate can be preserved in sediment for millions of years. These fossils are widely used by geologists to identify species and date ancient rocks.

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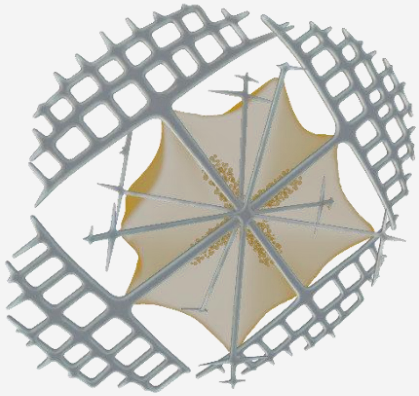
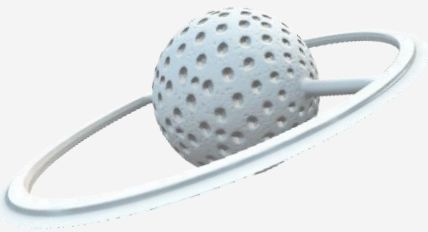


Lithoptera

Lineage : Radiolaria
Scale : 300 microns

Characteristics : *Lithoptera* is a member of the Radiolaria family (Acantharia), and its name means “stone wing” due to its very peculiar skeleton. *Lithoptera* has a mineral skeleton made of strontium sulfate resembling a satellite or jewel. This plankton harbors several intracellular small yellow algae that live in symbiosis, as in corals. In addition to predation, it is therefore able to obtain energy from the photosynthesis of its symbiotic microalgae.



Saturnalis

Lineage : Radiolaria
Scale : 200 microns

Characteristics : Described in the 19th century, *Saturnalis* is part of the *Radiolaria* and is characterized by its skeleton in silica that resembles the planet. This plankton has lived in the oceans for over 200 million years and fossils have been found from the Triassic period.

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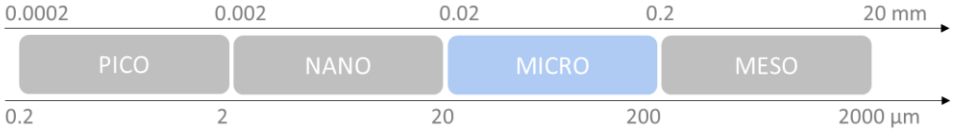
Scale: **MICRO**



Tintinnide

Lineage : Ciliates
Scale : 50 to 90 microns

Characteristics : *Tintinnids* can build an amphora-shaped skeleton (called lorica, which is not mineral). The form of this skeleton is different depending on the species (several hundreds of species). Found in both freshwater and marine ecosystems, tintinnids feed on small phytoplankton and bacteria, and have numerous cilia that enable them to move and capture prey.

Cosmioneis

Lineage : Diatom
Scale : 40 microns

Characteristics : The *Cosmioneis* diatom, which has an external skeleton made of silica (glass) like all diatoms, is abundant in the oceans. In the Auvergne and Ardèche regions of France, we find a silicate rock called diatomite. This rock is formed by the accumulation of diatoms at the bottom of ancient volcanic lakes.

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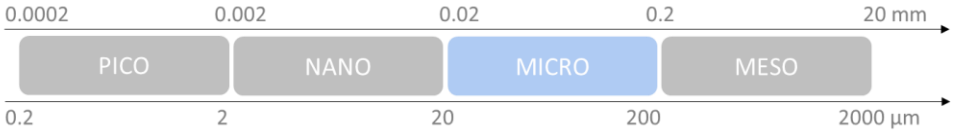
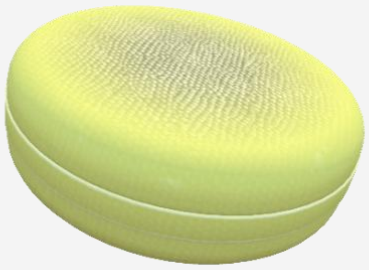
Scale: **MICRO**





Coscinodiscus

Lineage : Diatom
Scale : 100 microns

Characteristics : *Coscinodiscus* has an external round skeleton in silica (glass). *Diatoms* dominate cold and temperate waters, where they can make up over 80% of phytoplankton. Over 6,000 species have been identified to date, but many have yet to be described.

Ceratium

Lineage : Dinoflagellate
Scale : 100 microns

Characteristics : Described in the 18th century, *Ceratium* exhibits two flagella that enable this organism to move by whirling around. This group includes several dozen species living in marine and freshwater ecosystems, such as lakes.

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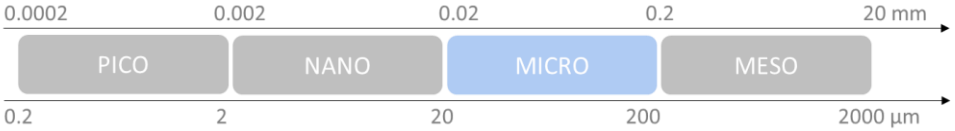

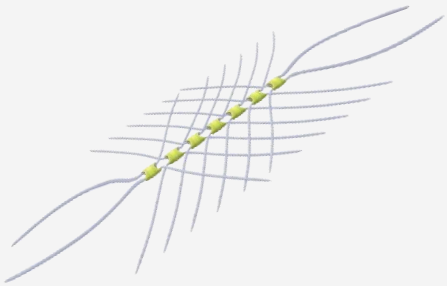

Chaetoceros

Lineage : Diatom
Scale : 100 to 200 microns

Characteristics : Like all diatoms, *Chaetoceros* is capable of building an external skeleton in glass (silica). It is a unicellular organism, but *Chaetoceros* is able to assemble with several individuals to form a ladder-like colony of several hundreds of microns. *Chaetoceros* is a group comprising several dozen species, found in the ocean.

Ornithocercus

Lineage : Dinoflagellate
Scale : 80 microns

Characteristics : *Ornithocercus* belongs to the dinoflagellates, but is not a microalga (phytoplankton). Described in the 19th century in the Atlantic Ocean, this plankton lives in warm tropical and subtropical waters and can establish a symbiosis with cyanobacteria housed in their collar. This plankton produces a theca in cellulose (organic).

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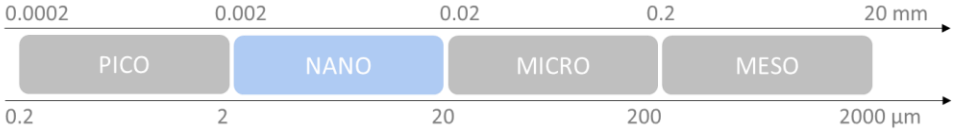
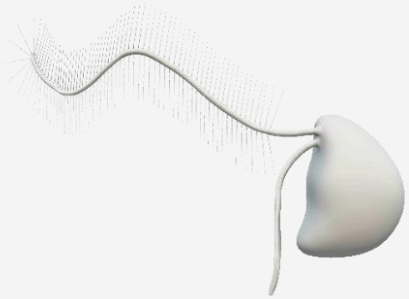
Scale: **NANO**



Alexandrium

Lineage : Dinoflagellate
Scale : 20 microns

Characteristics : *Alexandrium* can be toxic to humans as this plankton produces toxins. Scallops and mussels, which filter seawater to feed, accumulate *Alexandrium* in their tissues and are therefore the main vectors of paralyzing toxins during human consumption. This makes fishing or eating shellfish prohibited in coastal areas. *Alexandrium* can proliferate to very high concentrations on our coasts (several million per liter), changing the color of the water in red.



Cafeteria

Lineage : Stramenopiles
Scale : 2 microns

Characteristics : The name *Cafeteria* was given to this organism because of its ferocious appetite, which led to much discussion by its discoverers in the cafeteria of the Romberg laboratory in Denmark. *Cafeteria* is not a phytoplankton.

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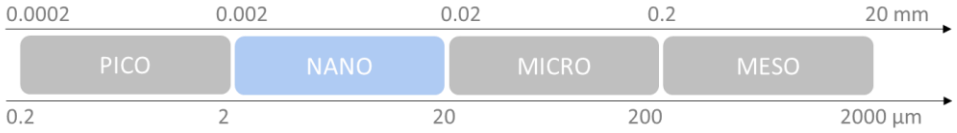
Scale: **NANO**



Emiliania huxleyi

Lineage : Haptophytes
Scale : 5 microns

Characteristics : *Emiliania huxleyi* is able to build an external skeleton made of small plates (called coccoliths) in calcium carbonate (chalk). *Coccolithophores* like *Emiliania huxleyi* can be very numerous in the oceans, and are visible from space during bloom episodes. When they die, coccoliths fall to the bottom of the oceans and can be the source of chalk cliffs over geological time, like the one at Etretat in France.

Chrysochromulina

Lineage : Haptophytes
Scale : 5 microns

Characteristics : *Chrysochromulina* is photosynthetic thanks to chloroplasts like other microalgae, but is also able to eat bacteria (predation) thanks to a fishing appendage, called a haptonema.

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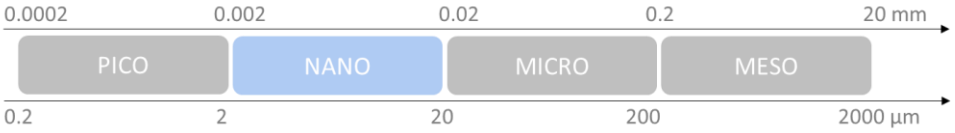

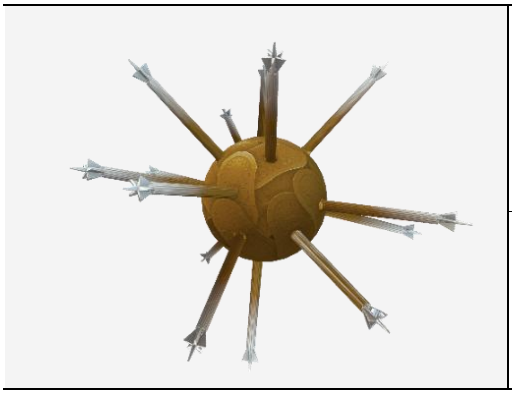

Rhabdosphaera

Lineage : Haptophytes

Scale : 4 microns

Characteristics : *Rhabdosphaera* is a coccolithophore capable of making different calcium carbonate structures (coccoliths) with spines, like *Emiliania*.

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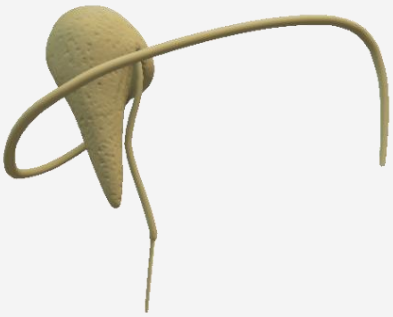
Scale: **PICO**



***Amoebophyra* parasite**

Lineage : Dinoflagellate

Size : 3 microns

Characteristics : *Amoebophyra*, a member of the *Syndiniales* family, is a plankton that parasitizes other plankton, particularly phytoplankton (microalgae). This parasitic infection, where *Amoebophrya* enters and digests the interior of its prey, is necessary for its growth and survival. These parasites are very useful for the equilibrium of the marine ecosystem, as they can kill plankton that are toxic to humans.

Prochlorococcus

Lineage : Photosynthetic bacteria (cyanobacteria)

Scale : 1 micron

Characteristics : *Prochlorococcus* is a bacterium that photosynthesizes generating its energy from the sunlight. Around 3.7 billion years ago, cyanobacteria were the first organisms to produce oxygen on Earth.

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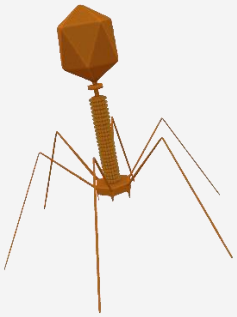
Scale: **PICO**



Phages

Lineage : Virus
Scale : 0.2 microns

Characteristics : The phage virus infects bacteria such as *Pelagibacter* or *Prochlorococcus*. It is the most abundant "organism" in marine plankton and very important for the equilibrium of ecosystems.

Micromonas

Lineage : *Archaeplastida*
Scale : 3 microns

Characteristics : The microalga *Micromonas* was described in 1960 and is considered one of the most abundant microalgae in temperate coastal environments. Up to 30,000 *Micromonas* cells can be found in every milliliter of seawater.