

Sea ice and the snow covering it often reflect more than 90 % of incoming solar radiation, i.e. that sea ice has a high albedo. Open water, on the other hand, has a low albedo and absorbs more than 90 % of the solar radiation. Very little light penetrates the snow and ice – and even less light reaches the water underneath the ice. Light conditions under the ice are important for both ice formation and melting and for organisms living in and under the ice.

## Reflectivity (albedo)

Light surfaces such as ice and snow help reduce surface temperatures on earth by reflecting a good deal of solar radiation back to space. It is important to understand the role played by ice and snow in this context, also so as to be able to predict future climate changes. The picture below shows a scientist using so-called spectrometers to measure both the light from the sun and the light that is reflected by the snow surface.

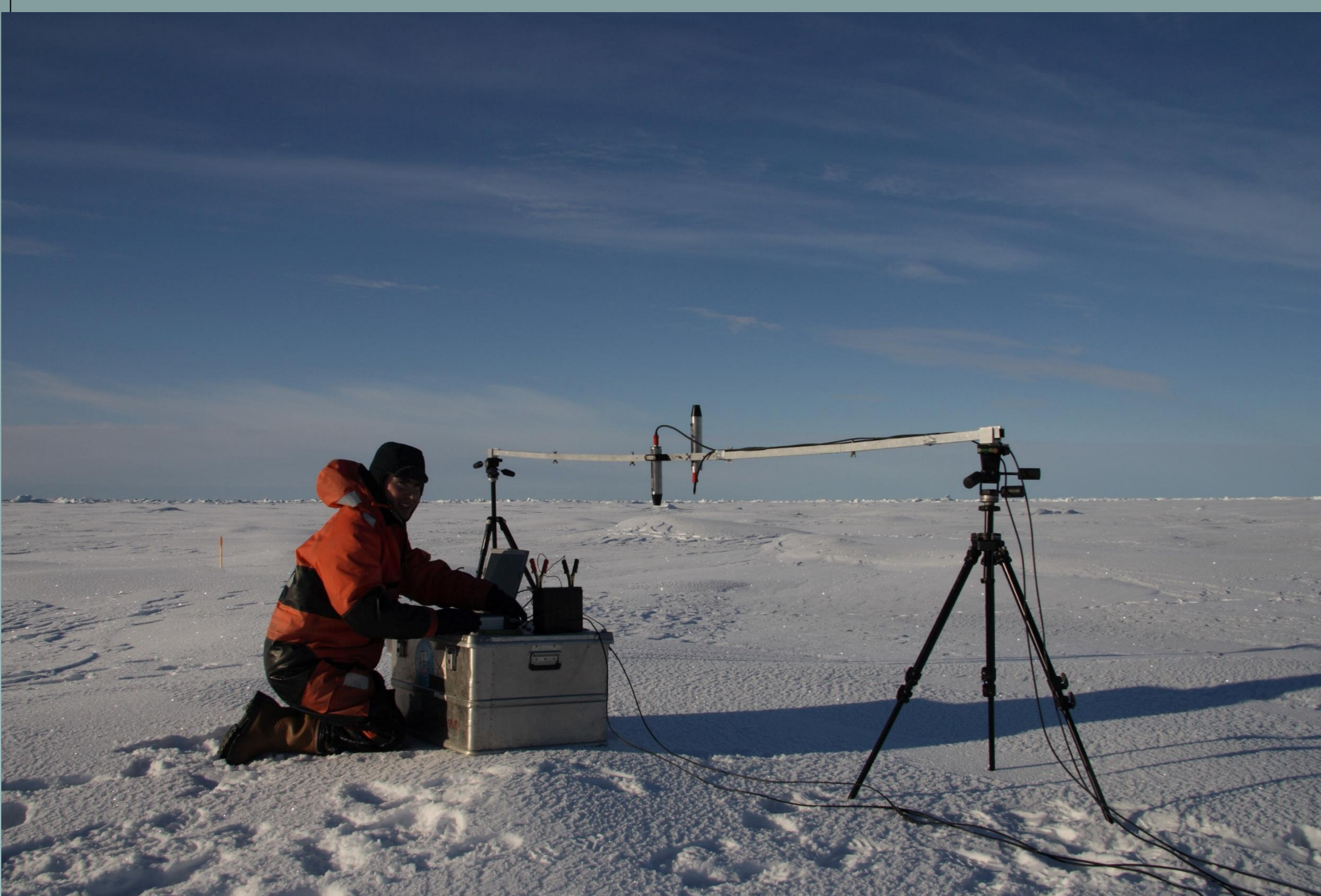
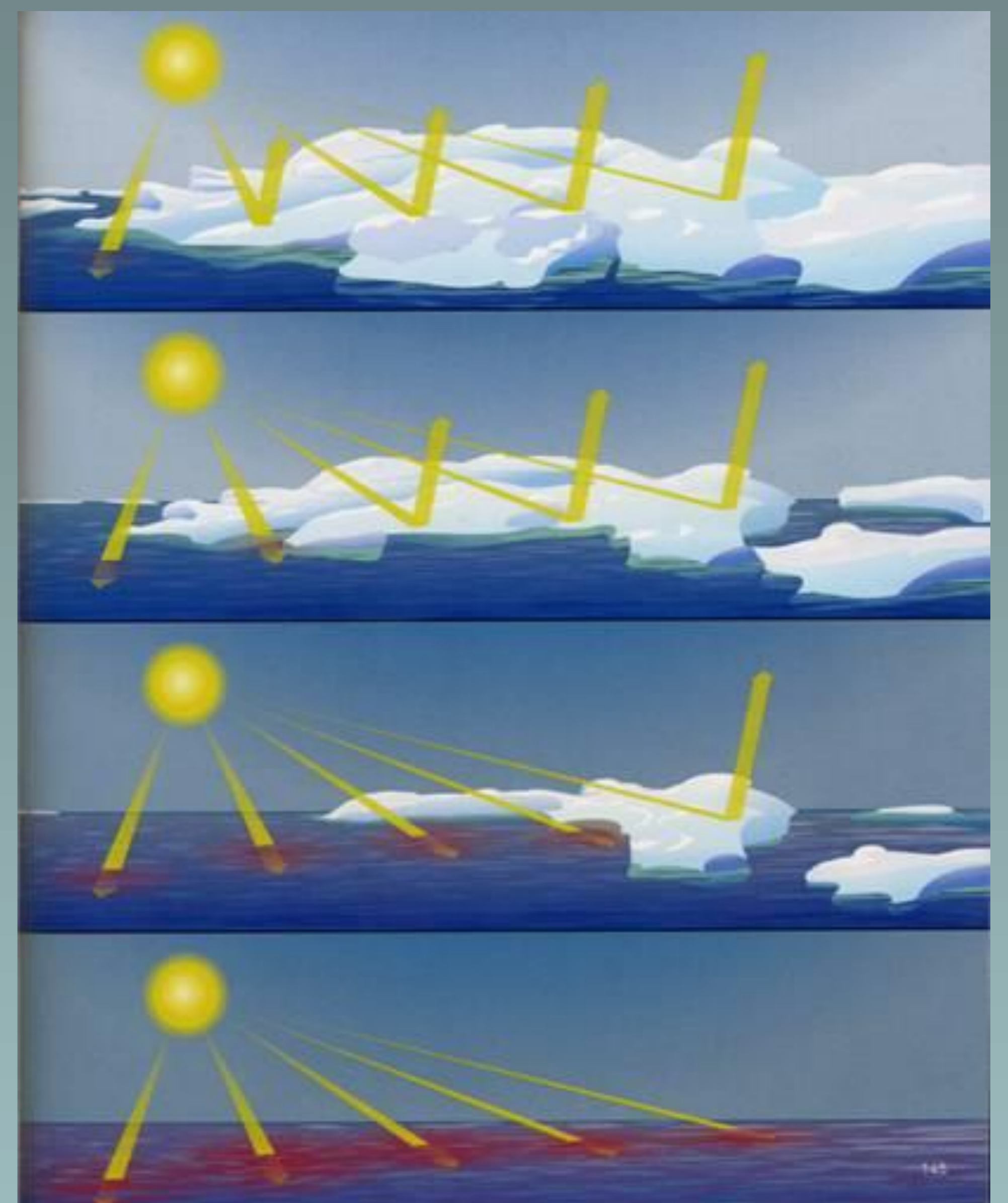


Foto: Marcel Nicolaus

### The albedo feedback mechanism:

When snow and ice melt in the Arctic, there is more open water and therefore less solar radiation will be reflected back from the surface. This entails the temperature rising and more snow and sea ice melting. This effect is reinforced the more snow and ice that disappears (self-reinforcing effect) and accelerates the melting of sea ice in the Arctic.

Photo: Terje Berntsen  
Graphics: Gore, 2006



## Transmission

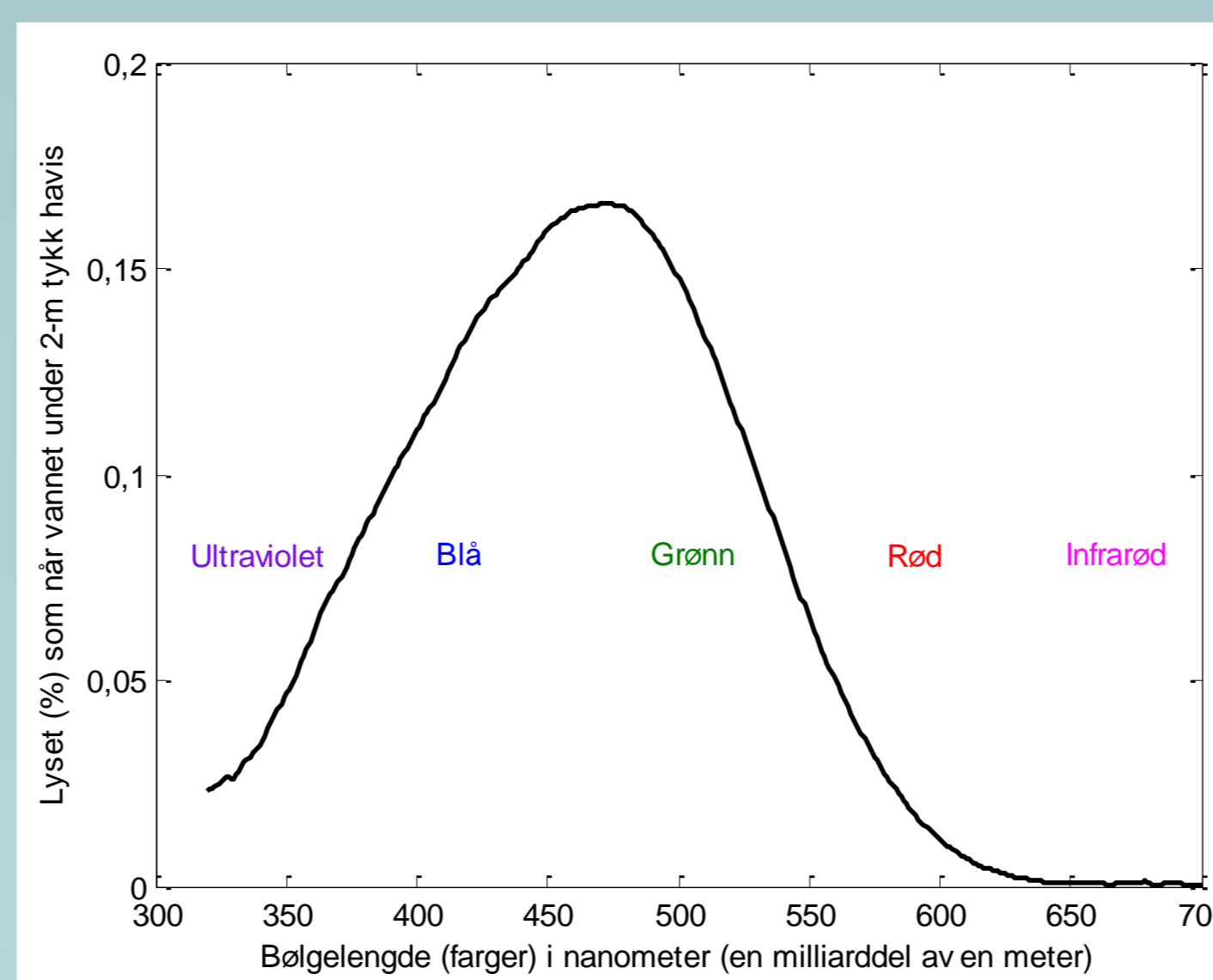


Foto: Sebastian Gerland

On a sunny day it is much darker and bluer under the ice than on the surface. Divers from the Coastal Guard help us measure light intensity under the ice.



Foto: Kystvakten



The figure shows the percentage of the light that penetrates 2 m thick ice (in % of surface light). Less than 0.2 % reaches the water under the ice, and the light is mostly blue and green.

Here we are measuring how much light penetrates the ice by sinking a light meter into a drill hole. In this manner we can measure at depths that are inaccessible to divers, or when we do not have divers to help us.



Foto Marcel Nicolaus