

## Logbook 13 (04/12/22)

Latest pre-Christmas-news: Our three on-board-Christmas trees will be decorated separately by international experts from Finland, Benelux and Germany. Maybe this will provide some hints towards deep psychology and identity of nations.

28-year old PhD-student *Marcel Nicolaus* (what a Christmas-name!) from AWI works on a subject called superimposed ice (sii).

**Question** Marcel, what is "sii"?

**MN** In the Antarctic summer we find a special ice layer within the sea ice called superimposed ice.

**Question** What do you mean by "special"?

**MN** Special in more than just one respect. Just to focus on the most striking one: This ice is fresh water ice - while normal floes contain enclosed pockets and channels filled with a saline liquid: the so-called brine.

**Question** Freshwater ice on a salty ocean...?

**MN** Snow is the key. We had 1.20 meters of snow on our ISPOL-floe, and that was not the utmost one can find. When this layer melts away - starting in November, the Antarctic spring - the melt water drains into the top layer and immediately refreezes.

**Question** And what we get is sii - superimposed ice?

**MN** Not immediately. The intruding melt water that refreezes permanently changes the structure of the snow. It becomes porous. Consequently little icy cavities form and thin layers of ice can be seen. At the end of this to and forth, we have frozen water on top of the melting sea-water floe. And this top layer we call sii.

**Question** And in summer both melt: the sea ice floe and its topping of fresh water ice?

**MN** Yes, but one after the other. Sea ice starts melting when the surrounding water gets warmer than minus 1.87°C. But the fresh water ice still remains that way until it attains 0°C. The original floe might have vanished for weeks when the sii is still drifting on the water.

**Question** And what is your specific goal?

**MN** We measure all changes going on in snow, ice and slush. Moreover, we take samples from ice cores, cut extremely thin layers and see, by using polarized light, what the crystals look like and how they keep on changing in the course of time.

**Question** That sure looks beautiful, but you are not just producing colourful posters, are you?

**MN** Definitely not. We have to go into small scales to understand global processes. Sii prolongs the time, the Southern Ocean stays ice covered. That has an impact on the total reflection of sunlight per year. But "albedo" is *Sascha Willmes`* prime subject, you better ask him ?

I will do that later. My batteries are empty. Merry Christmas, *Marce!*