Sun with a capital S

Michael Linden-Vørnle, in a conversation with Tine Nygaard

By Tine Nygaard

Michael Linden-Vørnle is an astrophysicist. He was invited to experience the works of Ruth Campau and give his opinion of them based on his own professional expertise. He began his visit by walking around the exhibition on his own. After almost an hour, I met up with him to hear what he had experienced.

Michael Linden-Vørnle: When I see colours as an astrophysicist, the first thing that always comes to mind is temperature, because colour and temperature are definitely interrelated.

Tine Nygaard: How so?

MLV: Because the method we use to actually determine the temperature of a star is by examining the colour of its light, because the star's atmosphere will emit light in a highly characteristic manner depending on how hot it is. The coldest stars emit a weaker, reddish light. The hotter the star, the yellower its light, and it ultimately becomes whitish yellow before actually turning blue. So the heaviest, hottest stars are actually blue. The first thing we can see is the star's colour. Then we can find out how hot it is.

TN: How do you do that?

MLV: By simply taking the light from the stars and spreading it out into its different colours.

TN: Like a spectrum?

MLV: Yes, like a spectrum. Spectroscopy is the most important technology we use in the field of astronomy, because once we've dispersed the light into its different colours, we can extrapolate a lot of information: the star's temperature, what it is made of, how it moves, and so on. If it's the Sun we're talking about, this corresponds to a rainbow. But if it's a hotter star, then its light will contain more blue, and if it's a weaker, colder star, it will be redder.

TN: So do stars have their own separate colour scale?

MLV: Yes, they simply have their own characteristic colour scale. So if these [the billows of Sunset Boulevard] represented stars, down at the red end they would be small, dim stars, and then we come closer to colours associated with the Sun and then perhaps some of these that are even hotter. We don't have the clear blue colours that would naturally be included if we took in the entire colour spectrum, because we finish here with yellowish-green, and we would have to continue into the blue hues and all the way out into ultraviolet because there's such a thing as light we can't see, too.

TN: So it isn't a blue like the one down here at the bottom?

MLV: No, not the bluish violet; they are clearer colours, because that one down there is a composite colour. But it's associated with something else when it's seen here, because besides being able to see the work as a colour spectrum, which represents the temperature of the stars, for instance, it can also be regarded as an evolutionary process, of the formation of stars. The way we imagine how stars were formed begins with a large cloud of gases and dust out in space. This cloud is usually relatively dark because it doesn't radiate any light by itself. And the cloud can become destabilised. This can occur if a dense star nearby explodes and the force of its explosion pushes the cloud, for instance. This will destabilise the cloud, after which the force of gravity will start to pull it together. When the gaseous sphere gets sufficiently hot and dense, the gas will begin to fuse and generate energy by means of a process we call nuclear fusion, in other words the merging of atomic nuclei. This sends energy out through the cloud and prevents the force of gravity from compressing it further. The balance between the force of gravity which compresses the gaseous cloud and the energy radiating from it are what we call a star. At one point or another, the gaseous cloud gets so hot that the star ignites.

But we also have trickling water in space. We usually say that four basic elements must be present before life can appear. We don't know how life begins. We don't even know what life actually is. So we say that in order for life to occur as we know it here on Earth – as the only life we know about for the time being – there must be some building blocks, some basic elements. These come from stars and other sources. The stars are what make the basic elements for us. We are born out of stardust. You could also say that we're a recycled product of burnt-out stars, but stardust sounds much more poetic. The stars' production of heavy basic elements is a prerequisite for making planets and life. So some energy is needed to make life, and this comes from the stars. In our case, the Sun is our source of energy. Elsewhere, the energy comes from other stars. So, liquid water must be present. Finally, a sufficiently long period of time is required. In the exhibition space, you have the flowing water, you have the energy, and you have the basic elements, so in reality you have the narrative about the development and beginning of life in this work of art.