

We are living in Concordia station, Antarctica, researching glaciology, climate and physiology. We haven't seen the Sun for 4 months and 4 months to go before fresh supplies are flown in. The temperature outside is -67.8°C .

Concordia station¹ and r/ScienceAMAs¹

¹Affiliation not available

April 17, 2023

Abstract

We are based at the French-Italian research station Concordia on the east high Antarctic plateau (75°S , 123°E , 3233m). It is one of the remotest, coldest, driest places on Earth, we are 1200 km from the coast and our nearest neighbour is 600 km away: the Russian station Vostok. The landscape is an immense white, flat surface of compacted snow extending 1000 km in all directions. The snow and ice on which we walk is more than 3 km thick. Living here is like living on another planet, 'Planet Concordia' or 'White Mars'. During the nine months of winter from February to November, the station is completely isolated from the rest of the world. No plane or vehicle can reach us, even in an emergency as the harsh weather conditions make all travel impossible. We have experienced temperatures down to -80°C and three months of complete darkness. The multicultural crew consists of 13 people: seven for logistics and six scientists. We are five Italians, one Swiss, one English and six French. This year we are three women and ten men from 24 to 56 years old. We must rely on our own skills and teamwork while being prepared to face any kind of emergency through training, fire, rescue and medical exercises. Antarctica is the largest, most extreme, multi-disciplinary, open-air scientific laboratory that helps us understand the mechanisms that regulate our planet, its climate, its history and offers a platform to observe and understand the structure of the universe, as well as charting the adaptation of humans to harsh environments. Thanks to the Antarctic Treaty, nations worldwide collaborate peacefully with respect for this environment in the name of science. We are one of very few stations at the heart of the Antarctic continent, so Concordia stands as an important node in the Earth Observatory Grid, for fields such as meteorology, seismology, geomagnetism and atmospheric chemistry. Lorenzo Moggio: 30 years old, Italian physicist, research fellow at the Bologna Institute of Atmospheric Sciences and Climate of the Italian National Research Council. This is my second winter spent at Concordia, I was here in 2010 as well. Giampietro Casasanta: 35 years old, Italian physicist with a PhD in Remote Sensing and research fellow at the Rome Bologna Institute of Atmospheric Sciences and Climate of the Italian National Research Council. I am in charge of the Italian glaciology and remote sensing experiments. Our tasks are to maintain and assure the scientific instruments work, retrieve the data run a first analysis and send it to Europe on a daily basis. We measure radiative balances at Earth's surface, Meteorological variables, optical and physical properties of aerosols, properties of clouds. We have at our disposal broadband and spectral radiometers in the shortwave, longwave and ultraviolet part of the electromagnetic spectrum, particle counters and sizers, lidar, sodar, sonic anemometers, automatic weather stations and sounding stations equipped with: barometers, anemometers, thermo-hygrometers, GPS and radio transmitters/receivers. Beth Healey: British medical doctor. I am running studies for the European Space Agency on the crew and myself to see how we adapt to living in this extreme environment. Our nine-month isolation living completely cut off from the world with low air pressure is similar in many ways to the stress astronauts will endure during a long spaceflight. I am running experiments on morale, eyesight, blood pressure and even searching for new life! <http://www.esa.int/concordia> Ask Us Anything about life here and the science we do! Moderator note: Due to a scheduling mix up they will not be able to answer questions at the normal time (turns out it's 1:30 am their time right now!) We will work on getting them online as soon as is reasonable, sorry for the confusion! Edit: We have started, sorry for the delay. Proof:

<http://imgur.com/joZLQvf>

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ABSTRACT

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This may seem a crass question at first: how's the hookup or dating culture? People who work together daily while isolated from the rest of society and family, living under artificial light for months at a time - it's a similar situation to the potential months-long trip to mars or objects outside of the Earth-Moon system. I've read enough questions and worrying about potential problems brought by sexual tensions in long-term, isolated, artificial environment missions so, from your experiences or those of others, does this have an impact?

[_sword](#)

There haven't been any relationships during our overwinter here. With only 13 people here you have to be careful as it can cause problems.

How is the human body affected without exposure to sunlight for 4 months? Also, what are some of the most incredible things you have discovered? (Such as the existence of life)

[Cat_astrophe7](#)

We have a number of experiments running here which consider our response to no sunlight. For example we are testing our pupillary response to a number of different waveforms of light every week. We are also looking at our sleep wake cycle using activity watches which we are wearing 24hrs a day. We have also been searching for bacteria which are able to survive outside in these extreme temperatures taking snow samples. Results will be published next year :)

Thank you for the things you do for humanity!

My questions are:

- 1. How or where do you dispose sewage?**
- 2. Where and how do you get water and electricity?**

[daxcc](#)

We have a grey water recycling machine here which is a prototype for that used on the ISS. I test the quality of the water ever 2 weeks in my lab. We add to this water supply by melting fresh snow. There is a power station here and the fuel arrives to the station via an overland traverse which travels 1,300km from the coast during the summer.

Hello from Palmer Station! (Antarctica)

I am the chef here and noticed both of us had articles published about us this month.

Our RA, Lance also worked at that station some time ago. He speaks highly of it.

I hope all is well and you are enjoying your winter. We only have about 2 months left here.

Our Population is 15 men 3 women.

[alaska56](#)

Hello ! Here we have a population of ten men and 3 women, and we are 80 days far from the end of the isolation, so our winter is almost over. We hope all is were down there, good luck !

What sort of Internet connection do you have there and how fast is it? Also do you have to take vitamin d or any other supplements to stay healthy?

[Stargazer9999](#)

Hi! At present we have a geostationary satellite connection 512kbps which is quite slow but allows us to have Skype calls (only on one PC, one at a time) with home for example. General vitamin supplements are available to the crew but are not compulsory.

What sort of Internet connection do you have there and how fast is it? Also do you have to take vitamin d or any other supplements to stay healthy?

[Stargazer9999](#)

We have a geostationary satellite 512kbps connection, it is quite slow but we can have Skype calls (one at a time) with our families for example. Anyway the signal is not always good. General vitamins supplies are available to the crew but not compulsory.

Hi! Great you can join the world through the internet. How did you prepare for these extreme social and environmental conditions? And more specific: How long did you know each other before the trip?

Thanks in advance.

[whitehotaru](#)

Hi! Prior to departure we had Human Performance Behaviour training as a crew at the European Astronaut Center in Cologne organised by ESA. We also had further training to prepare us for Antarctica with IPEV (French Polar Association) and PNRA (Italian Polar Association). As a doctor I had additional expedition medical training in Chamonix which was organised by IPEV.

I am interested in the boring minutiae of day to day life. Do you cook and clean for yourselves, or are there service staff? How do you spend your down time? How do you deal with sewage and garbage? And any other interesting things to do with that side of life there?

[quaswhat](#)

We have a professional chef, but we deal with all the rest of the services, recycling what can (water included).

What's the biggest detriment to morale during the long winter? And what can/do you do to boost morale? How do you deal with each other's annoying habits - like, if there's one person who is a loud chewer, or someone who hums too much?

[Wishyouamerry](#)

The long dark period itself, but of course we have to be a very patient person to spend one year in isolation ! :)

What is the single most wanted food item that you can't have before re-supply?

[super_symmetry](#)

We all miss fresh vegetables and fruit very much. We are really looking forward to see fresh supplies next november!

What is the single most wanted food item that you can't have before re-supply?

[super_symmetry](#)

I am craving fresh mango and avocado!!

Surely you all keep very busy, but what do you do with your downtime? What sort of entertainment or recreation is available? Thanks!

[musicman3739](#)

Life on base is surprisingly busy here. Research takes up the majority of my time but as we live as part of a skeleton crew we also have many additional roles (for example fire team). We also all help with communal jobs e.g. cleaning and washing up. Recreationally we have a gym and video room. Personally I really enjoy photography so spend a lot of my time doing this as well as learning French and drawing. We also do many Skype conferences and outreach activities to educational institutes and museums (like this reddit!). In the summer there are lots of sporting activities to take part in outside. Our chef also makes an effort with themed meals and events which gives us an opportunity to spend time together as a crew.

What projects regarding climate are you working on there? I am a PHD student in physical oceanography and focusing on climate, would very like to go to Antarctica someday...

[fischcheng](#)

There are basically two main fields of research, glaciology projects mostly related to paleoclimatic studies, and Atmospheric Physics and Chemistry activities to monitor and assess the overall Antarctic climate. More specifically, for instance, we are a node of the BSRN network, perform daily atmospheric radiosoundings (GTS network), maintain a complete weather station, and monitor the Atmospheric Boundary Layer and the PSC height using a sodar and two lidar systems.

Do you ever think about finding [The Thing](#), or waking the Old Ones and what might happen after that?

More seriously, as an isolated outpost what happens if something goes wrong? Are there multiple redundant whatsits? What piece of equipment is most critical? If something were to break are there procedures in place and what are they like?

[FuguofAnotherWorld](#)

Haha, The Thing is just a nice movie to be seen at midwinter :-). I think the most important thing is the power station and of course electrical generators. Of course we have emergency procedures and redundant systems in case of failures. On a monthly basis we do fire, emergency, medical and rescue exercises and once a year a big evacuation exercise to an emergency shelter, the summer camp.

How does one power this Antarctic laboratory? If it's diesel generators, How do you power the place during the winter? do you just have a massive tank of diesel somewhere?

[rainbowars](#)

Electricity is produced with diesel generators and heat comes as a by product through cogeneration. Of course outside we have massive insulated and heated diesel tanks to supply the station for the whole year. Diesel is also winterized. In the next years a solar implant is going to be installed (mainly useful during the summer period when we have the higher power needs). Wind here at the ground is usually quite low (2-3m/s average).

My question is, how do you deal with the drama and conflicts? Being in a confined space for extended periods of time must take its toll (perhaps make you anxious, irritable).

[sozesghost](#)

We human performance behaviour training at the European Astronaut Center in Cologne prior to

departure which has helped us deal with potential problems.

@Giampietro and Lorenzo: I know that there are also satellites measuring things like the components of the atmosphere, temperatures, etc. What is the added benefit of being right there on Antarctica? How are both types of data (yours and the data from satellites) used?

[Voerendaalse](#)

Satellite measurements have wide spatial and temporal coverage, but are usually less precise and reliable. On snow covered surfaces it is quite difficult for example to distinguish clouds especially on the Antartic plateau where we are. Part of the instruments we have here are used to calibrate and validate satellite ones.

What's a typical meal consist of for you guys?

[I Cant Go For That](#)

Frozen, dried and freeze-dried food, but our chef has a lot of fantasy... of course we miss fresh fruit and vegetables, after 6 months without being resupplied.

What's the backup plan for if the heater fails?

[pekayer10](#)

the problem usually is if all power generators fail in case for example of a massive fire. We have an emergency shelter 500m from the station, the summer camp. We have to heat the power station there very quickly using a small generator pre heated, turn on the power station and we would be safe even if in survival condition. The starting up of the emergency shelter, the summer camp usually takes at least 3 days hoping everything goes right.

How do you guys stay warm? What type of system heats your compound? I work in the HVAC industry and I can't imagine the issues with equipment operating in those conditions.

[jjrdk4](#)

Mainly cogeneration from diesel generators.

How big is your living space and what could you do for fun? Also, how far in advance before this did you know each other? I imagine they don't just throw random people together and hope they like each other.

[ChaseLB](#)

The station is quite big, two buildings connected by a corridor 3 floors each (each floor is around 200 square meters surface). One with calm activities (bedrooms, laboratories, hospital etc), one with noisy (kitchen, dining and living room, food storage rooms, gym, workshop). We have single bedroom during wintertime, while during summertime we share it with another person. For fun we play music in a small band, do sports in the gym, improve our photographic skills, watch movies, learn languages, listen to music, The official wintering team met for the first time for one week course on human behaviour performance at ESA European Astronaut Centre last october (one month before the departure). With a rational, pragmatic, open attitude towards the others anybody can learn to respect and live with anybody else, no matter your language, culture, personality.

Is anyone acting strange? Did a random dog from the Norwegian camp show up? Any underwear stuck in the trash chute?

If not be cautious...

Seriously how often do you watch The Thing?

[julbull73](#)

Luckily The Thing is for now only a nice movie :) Usually there is a tradition, especially in American Antarctic stations to watch the movie during midwinter.