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**LIVING AND WORKING IN ANTARCTICA**



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ABSTRACTS SUBMITTED TO THE (CANCELLED) SCAR 2020 OSC IN HOBART

## Finding a 'sense of place' upon the white expanse of ever moving ice at the end of the world

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Antarctica is a place with no Indigenous peoples, a place with no real human story. It is a kind of frontier of impermanence. It is not a place to plant roots, or raise a family. It is a place of short contractual work, research, and experimentation. It is a place in which our survival is utterly dependent upon the structures we have built. It is not a place to make a home nor a place to live out your full experience as a human being. It is a frozen and melting land mass beneath the southern lights at the end of the world. It is a haven for wildlife trying still to escape the effects of our kind. It is an iced over dessert that attracts displaced inquiring minds in human form for months at a time. It is a place so remote, cold, white, and hostile, that our very mortality is always in question. It is in this very mortal relationship we share with this place, that forges our identity, and dictates our way of life. Ours therefore ought not be a question about living and working in Antarctica, as much as it is a question of "being" in Antarctica. How am I to be in Antarctica?

## Perception of harassment in expeditionaries of the Brazilian Antarctic Program

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**Introduction:** Harassment is a psychosocial risk characterized as a recurrent and intimidating behavior that is usually harmful. The topic became prominent in public discussions regarding polar environments in 2018, especially after notorious accusations, and gaining force due to the #Metoo movement. **Objective:** to investigate the experiences of perceived harassment in expeditionaries of the Brazilian Antarctic Program (PROANTAR). **Methods:** a pilot study utilizing an online questionnaire with PROANTAR expeditionaries (n = 16), to improve a risk management protocol in Antarctica. **Results:** Four participants, all-female, reported having suffered harassment. Eight participants witnessed or heard about fellow victims of moral and sexual harassment. Of these, only five reported what happened. Fear of reprisals from their superiors was the main reason for not reporting the cases. Ten people (seven women and three men) agreed that women are more at risk of harassment than men. Ten people agreed it is possible for men to be harassed, and two disagreed. **Conclusion:** Where there are human interactions there is a risk of harassment, whether in a polar (confined and isolated) environment or not. It is important to raise awareness about harassment and to encourage reporting, reducing both inaccurate definitions or perceptions of interactions and victims' fear of exposing this type of violence. PROANTAR's actions to support sensitive research aimed at the safety of its expeditionaries must be acknowledged. Respondents considered the research important and its continuity is necessary for a better understanding of the issue and consequent harassment prevention.

## The New Zealand International Geophysical Year (IGY) program and the start of the NZ Antarctic Research Programme.

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New Zealand (NZ) scientists contributed to the objectives of the 1957-58 International Geophysical Year (IGY), by expanding the range of regular meteorological and geophysical measurements at its existing observatories (e.g. New Zealand, Campbell Island, Samoa) and setting up several new observatories that extended to 78° S (Scott Base) in the south and to 0.1° N (Tarawa in Kiribati) in the north. The proposed research program was carried out largely by existing government research agencies using partially redirected resources with some additional funding to support the expanded programme of geophysical research. It was coordinated by an interdepartmental government committee under Dr E Robertson. A comprehensive programme of research was developed for Antarctica involving a new base in the Ross Sea region. At the same time the government agreed to support in part, the Ross Sea Support Party for the UK based Commonwealth Trans Antarctic Expedition (TAE). The new joint base, Scott Base, was set up in McMurdo Sound, for both the IGY party of five scientists and the TAE Ross Sea Support Party. In addition, three NZ scientists undertook the IGY geophysical research programme at Hallett Bay – a joint US/NZ base on the western Ross Sea coast. For the second part of IGY (March to December 1958), Scott Base was run by the NZ government and an expanded research programme and new scientific coordinating committee developed – the start of the New Zealand Antarctic Research Programme.

## Research For The Turkish Antarctic Research Station (TARS)

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Research For The Turkish Antarctic Research Station (TARS)

\*Yuksel Demir

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This paper summarizes the initial phases of the research done for the establishment of The Turkish Antarctic Research Station (TARS)

The most important part of the research process is precedent analysis, in which each base is examined in detail. Within the frame of the criteria determined, 31 bases were first selected and a database containing basic data about these bases was created.

In addition to the database, a short report has been written for each base in the database. In the data collection process, besides basic resources such as COMNAP and ATCM, data obtained as a result of one-to-one interviews with the designers of the bases and national Antarctic Program managers of the countries, and the feedbacks of Turkish researchers from various bases during TAE I and TAE II expeditions were used. Since the Spring semesters of the 2018-2019 academic year, research by design studies was conducted and continues in undergraduate and graduate project studios. In doing so, the findings obtained in the preliminary research, different design strategies, program, and design suggestions were developed. We did also contact potential stakeholders. It is planned to establish a platform that includes stakeholders from all disciplines (including artists, philosophers, and intellectuals) in order to share and facilitate the development stages (Research -Design -Development) of the base.

## The New Brazilian Antarctic Station Comandante Ferraz: prospects for the antarctic constructions technological innovations

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After the first geological-geotechnical studies carried out by the Brazilian Navy in the Antarctic summer 2014, the construction work began for the new Brazilian Antarctic Station. This civil work was designed for the research development in several areas of knowledge, such as geosciences, engineering, biology, chemistry and medicine.

The construction was completed in 2020 and has 4,500 square meters of built area, including 17 laboratories for Antarctic research. The Station has an energy cogeneration system, comprising diesel generators integrated with renewable wind and solar energy modes.

Adverse environmental conditions, such as winds up to 200km/h, soils subject to freezing and thawing cycles, the occurrence of ice sheets in the subsoil, as well as earthquakes, have made the construction in Antarctica an engineering challenge. Thus, both in the design phase and construction, the foundation soil geotechnical characteristics and the site environmental conditions were observed, in order, for the technical adjustments to ensure the safety building condition.

The construction process experience and the sensors implantation for monitoring the soil and the Station structure will be the subsidy for the new construction technologies development in Antarctica, including a laboratory for the soil and foundations behavior studies under the Antarctic environmental conditions.

## Penguin Priests and Glacial Gods: Religion and Spirituality in Antarctica

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In literature of Antarctica, one religious theme appears the most frequently: death. Death is always nearby, in the crevasse of a glacier or swirling in a blizzard. Although most corpses lay buried where the person died, there are three cemeteries on Antarctica, as well as places of worship. The first aspect of this paper is dedicated to these spaces, from the few actual churches built in Antarctica, to rooms in research stations where religious services are held. Linked closely to the actual “architecture” of religion are the accompanying musical and artistic components of spirituality. In several texts about Antarctica, such as explorers’ journals, polar parties sing hymns and carry images of God. Similarly, the use of prayer appears in many pieces of Antarctic literature. Nearly everyone who has traveled to or lived on Antarctica has remarked about being awestruck upon seeing Antarctica for the first time, and those who openly spoke of being agnostic or atheist, admitted to their beliefs being tested, for numerous reasons: the unbelievable beauty, the majestic natural magnificence, surviving incredibly harsh weather, or somehow escaping certain death. This paper illuminates a spiritual aspect about Antarctica: unlike a mirror, the ice of Antarctica reflects a shattered image, like that of a broken heart, and perhaps that is the pull to Antarctica. Being in Antarctica might give those who are paralyzed by grief a small taste of heaven, because it is so remote, so beautiful, and so peaceful. Truly, Antarctica might be where mourning dawns and hope arises.

## What do people new to Antarctica and the sub-Antarctic need to know about the weather and environment? Advice from people living and working in Antarctica and the sub-Antarctic.

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Antarctica is an extreme and isolated environment where cold exposure can lead to injury, diminished cognitive capacity, decision errors, and even death. Understanding, awareness, and knowledge of the environment may reduce risk and improve human safety, performance and resilience in Antarctica. Information may be passed to new expeditioners through the mentoring, tips, and stories of experienced expeditioners. We were interested in what the people who have lived and worked there thought it was important for 'new' people to know, learn, and remember about Antarctica's surprising, changeable, and potentially deadly weather and environment. Essentially, we were interested in what we can learn from people who live and work in these extreme environments.

As a part of an exploratory study of weather information use and decision-making in the Antarctic and Sub-Antarctic we interviewed 30 people who were currently or recently deployed there. Interviews were conducted via video and audio calling, email and in person. Participants included people who were very experienced in their roles with multiple years and trips to those who had only one season of experience. Here we examine participants thoughts on severe weather and risk in Antarctica, and their answers to the question: "What does someone new to Antarctica and the sub-Antarctic need to know about the weather and environment?"

We discuss recommendations and advice people might give to a new colleague in Antarctica and the sub-Antarctic, and how this information can be used to guide training and enhance performance for those working in these environments.



## Weather information sources, decisions, and needs: Insights from an online survey exploring how, when and why people use weather information in the Antarctic and sub-Antarctic.

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Weather affects everyone in Antarctica, dictating work, travel, and research schedules. Adverse weather can risk lives, impede research projects and prohibit outdoor activities which can have catastrophic impacts on organisations involved in polar work. Additionally, there is limited literature on weather information use and decision-making in Antarctica. As such, understanding people's weather information use is important to improving weather services, human safety, and performance in these regions.

Using an online survey, we collected information on the types and sources of weather information used by people recently deployed to Antarctica and the sub-Antarctic and how this influenced decision-making. Participants were from National Antarctic Programs, tourism operators, and private organisations with Antarctic experience ranging from a single deployment to multiple trips over the last 20+ years. Participants included tour guides, tradespeople, pilots, scientists, forecasters, and managers.

Results indicated that weather information was used to plan and schedule activities, minimise risk, and maintain safety. Planning decisions and choice of weather information source were context and task specific. People often discussed weather decisions with weather professionals, operations managers, field support, captains, colleagues, and supervisors. There were similarities in people's weather-related decision-making and information use despite variations in their locations and roles. Wind speed and direction along with short-term forecasts were perceived as the most useful weather information to guide decision-making. Access to forecasters was deemed extremely valuable for weather decision-making. Results of the current study demonstrate that weather information and weather-related decisions are an important part of participants Antarctic functioning and ability to work.

## Emergence of Antarctic Biomimicry: potential for an interdisciplinary approach to building design

Katelyn Hudson<sup>1</sup>

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Antarctic architectural expression has evolved from pure, basic shelter, to space-age capsules that crawl around the ice. Though separation and buffer from the natural environment have remained. Not only for basic survival that the extreme climate requires but from familiar building and design practices. The direction that station design has progressed opens the door for other approaches that discover how other aspects of that natural environment have existed in Antarctica. Biomimicry is a design practice that was identified by the scientist Janine Benyus in the mid-1990s; endeavouring to study and learn from strategies employed in nature and how they can be incorporated to solve problems. It built upon the biomimetic work of Otto Schmitt and is included in Stephen Kellert's biophilic design attributes. Applications range from design, materials, optics, systems, etc., but this research focuses on the potential for architectural design. To date, there has been no completed architectural intervention that has used biomimicry in Antarctica. Investigating two published conceptual works from 2014; the snowflake greenhouse of the Venice Biennale and the student project: Transformable Antarctic Research Facility (iceberg), there is room for an interdisciplinary approach to biomimicry in future station design that goes beyond an aesthetical shell. Entailing interdisciplinary work of architects and engineers together with the scientists to learn from their research to study environmental, floral, and fauna adaptations that could merge into building design. This is a logical potential trajectory of the future of Antarctic Architecture.

## Biophilic Design in Antarctica: connecting to nature through architecture

Katelyn Hudson<sup>1</sup>

<sup>1</sup>*Bond University, Robina, Australia*

Humans developed the built environment through a series of behavioural patterns interacted with natural aspects necessary to provide shelter and protection from their surroundings. These practices have continued to innately be utilised and identified as 'biophilic design'. This research investigates how those elements have been utilised in one of the few climates where it is particularly pertinent, requiring humans to still rely on buildings purely for the basic purpose of survival, Antarctica. Through a case study framework, six examples of buildings ranging the history of human habitation in Antarctica will be explored; Robert F. Scott's Hut at Cape Evans, Douglas Mawson's Hut, Australia's Casey Station, United Kingdom's Halley VI, and the United States of America's McMurdo Station and Amundsen-Scott South Pole Station. Not only do they represent significant periods in the relatively short Antarctic history, but they illustrate different scales, building practices, material technology, cultural backgrounds, and location within the continent. The cases will be then analysed based on the elements and attributes of biophilic design to investigate how it has been integrated. The result of this research gains greater insight into biophilic design regarding residential architecture, as well as tracking building practices concerning occupant well-being.

## Does a specific “space culture” develop on the ISS?

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Researchers interested in the workplace have long studied corporate cultures and their variants in other environments. There is general agreement that workplaces have individual characteristics, norms as to interpersonal behavior, dress codes, acceptable and unacceptable modes of communication, and so on. With regard to long-duration spaceflight, such topics have typically been addressed indirectly, by examining interviews, reminiscences, and other evidence that the researcher could use to infer what the crew experienced as unique and shared, and which social scientists could interpret as cultural. The current study, involving 13 astronauts (NASA and other agencies), took a more direct route by administering questionnaires to the participants at various stages of their service from training through spaceflight and after returning to Earth. Questions asked whether the participant identified the existence of a specific space culture, its features, its importance as compared to the culture of national origin and sponsoring space agency, and the norms of those different cultures followed by the astronaut as a function of circumstances. This report presents the data from two on-orbit questionnaires. For comparison, similar questions were asked of Arctic personnel at remote stations.

## The Graveyard Shift: An Investigation into the Peculiar Case of Deception Island.

Elizabeth Lewis Williams<sup>1</sup>

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The Base Journal for the British base on Deception Island 1953-4 opens with a death. The fact that it is a suicide is not recorded. Two days later, after landing stores and coal, and stripping the No 1. engine, the men start digging a grave in the frozen ground of the old whaling cemetery. It takes three days. Five years on, the General Report and Base Journal for Deception begins with a note that this year had probably been the happiest in the history of the base, and that the island should no longer be considered one of the worst postings for members of the Falkland Islands Dependency Service.

With particular reference to early Base and Field reports, as well as to letters and memoirs held in the British Antarctic Survey archives, this paper will examine what gave rise to such a negative view of Deception Island. The psychological report from Halley Bay in 1959, which comments on the difficulties of life on a static base, particularly over winter, when “one had to adapt oneself to circumstances or perish”, suggests that some of the difficulties experienced on Deception were common elsewhere. Comparing the rough notes of two recovered diaries from Deception to official reports from the same years, this paper will highlight the psychological pressures of winter darkness, and the various means by which the men were able to combat it, attempting to answer in the process whether or not there was indeed a peculiar case of Deception Island.

## The Ministry of Food: the practical, psychological and symbolic importance of food as evidenced in early British Antarctic Base and Field Reports.

Elizabeth Lewis Williams<sup>1</sup>

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In Antarctica, where everything required for a person's survival has to be imported, all aspects of food take on a significance over and above its necessity for keeping people alive. With particular reference to the Base and Field reports from the early years of the permanent British Antarctic research stations, this paper will explore the significance of food, showing that its preparation and shared consumption was important not just for feeding the body, but psychologically and symbolically: for maintaining individual morale and developing team spirit; for providing occasion for moving out of gender roles at a time when British bases were all male communities; for building a sense of home in an alien environment. Looking back at this period and beyond, we can also see from writing about food the apparent collapse of the material and the abstract, the real and the imagined, which is one of the characteristic aspects of the Antarctic experience as it is presented in writing. Birds, for example, provided a source both of companionship and fresh meat, as well as a different means of reading the environment; rituals surrounding the celebration of particular occasions, often with a very limited range of things to eat, were one of the ways in which food figured not just as something eaten but as part of an imaginary construct. A study of food, and attitudes towards it, has much to tell us therefore about what motivated the men who worked in Antarctica, their sense of values, belonging and identity.

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## Creating 360° footage of South Africa's Antarctic and sub-Antarctic research stations; SANAE IV

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The Antarctic Legacy of South Africa (ALSA) is a Knowledge Development Grant project within the South African National Antarctic Programme (SANAP). Its aim is to facilitate knowledge building about the work and life at the three stations of South Africa on Antarctica, Marion Island and Gough Island. ALSA was granted the opportunity to visit SA's Antarctic Station in January 2019 during the take-over period, tasked to gather 360° footage of the SANAE IV station. The SANAE IV base can now be viewed through a 360 tour available on the SANAP website.

This material will play a big role in the preparation of future overwintering personnel, as they will now be able to familiarise themselves with the station and get a sense of how it will be to live in the confined space of the station. It will also give family and friends of team members and take-over personnel the opportunity to understand their loved one's new environment. This new addition, the 360° station exploration, to the Antarctic Programme was released on International Antarctica Day 2019, on the brand new upgrade of the SANAP website.

This presentation will give insight into the process of creating this material in a short time span. The process and difficulties in getting the footage will be discussed, as well as the most effective way to make this knowledge open accessible.

## Working as researchers in the challenging research field of human biology and physiology

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The most isolated and extreme continent of the world offers a unique opportunity to investigate several aspects of human physiology, psychology and sociology in this environment that includes research ships, research stations, shelters and remote research camping's. However, in comparison to the major fields of scientific research covered in most Antarctic Programs the research in human biology, human physiology and medicine is under-represented. This is a very challenging field of Antarctica work. Diversely of other researchers studying the air, the water, the ice, and the earth in its many aspects, the human biologist investigates the military personnel, the staff in the Research Stations and Ships, and the scientists that work in Antarctica. Several specificities in this kind of research demand extensive planning, logistic details and adaptation of operational schedules impacting the quality and quantity of data collection and implicating the outcome of scientific publications. The human biology approach needs to consider ethical aspects, the limitation of human and technical resources and equipment restrictions to be transported. Most research in this field depend on voluntary recruitment and usually demand long-term follow up, including pre and post examinations of the subjects, which are difficult considering the composition of the research groups of civilian and military voluntaries, with their diverse geographical origins in Brazil and other countries. We expect to bring our experience, perspectives, and our motivation in order to facilitate the discussion about the socio-cultural dimensions of working in Antarctica as while researchers in the human biology field.



## A clinical audit of knee and ankle injuries on Macquarie Island 2000-2014

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Ingrid McGaughey and Peter Sullivan investigated the epidemiology of knee and ankle injuries on Macquarie Island in 2001. Over the period examined in the first paper from September 1990 - August 2000 13% of medical consultations were knee and ankle injuries. The new clinical audit has reviewed the subsequent period from September 2000 to March 2014. Despite the prevention program instituted by the Polar Medicine Unit since the McGaughey and Sullivan findings, knee and ankle injuries continue to represent 12.1% of recorded consultations on Macquarie Island.

Macquarie Island is a sub Antarctic Island with a rugged and unforgiving terrain and this level of injury is not unexpected. The preventative measures introduced since 2001 have not significantly reduced the number of injuries. Department of Primary Industries, Parks, Water and Environment, Tasmania (DPIPWE) screened their Macquarie Island Pest Eradication Program (MIPEP) employees before deployment which also did not reduce injuries during the MIPEP. It may be that screening before departure or preventative measures cannot overcome the dangers and risks posed by Macquarie Island.

## Traversing Antarctica: Inhabitation on the Move

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Due to the relative inaccessibility of Antarctica, the small number of studies that investigate inhabitation from cultural, historical and geopolitical perspectives are centred on interpretative and/or archival research. Limited research comprises remote fieldwork and embodied encounters with the extreme environment.

This paper focusses on the inhabitation and the interior conditions of the French IPEV logistical traverse that resupplies the French Italian Concordia station. The traverse is explored as a spatial practice and a distinct mode of inhabitation through an autoethnographic investigation. This study of the traverse offers an alternative understanding to the sedentary Antarctic stations and provides an engagement with the environment different to that of regular scientific traverses. As participant observer on the IPEV traverse RAID63, I developed first-hand and experiential knowledge of inhabiting Antarctica. This study – through an embodied engagement with the technical, social and natural extreme environment – is located at the intersection of the Antarctic humanities and interior design theory.

This exploration into the traverse extends existing understandings of Antarctic inhabitation. The turbulent environment operates as an organising and forceful agent in the production of interior conditions. My investigation reveals a glacial mode of inhabitation; one that replaces a sedentary way of living for a living/moving with the ice. On the traverse, inhabitation and the notion of the interior must be constantly reinvented in the accelerations and decelerations determined by Antarctic forces. Balance, rest and comfort – traditional assumptions of the interior – can only be found within the movements of these external forces.

## Antarctica in Black; Expression of Feelings of Antarctica through Art.

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South Africa has sent overwintering teams since 1948 to their stations in the Antarctic region. There is also a takeover period during which conservation and construction personnel and scientists visit these stations for work. Most of the people that work in Antarctica have the tendency to capture these experiences in photographs diaries and videos. However, there is a few that express their feelings and emotions in sketches and paintings. Jess Verheul,, a scientist and an emerging artist expressed this through sketches in ink - hence the name "Antinktica". During a Research Expedition to Antarctica (the South African National Antarctic Programme – SANAP) she spent some of her spare time sketching while watching the world around her. She state in her book "Armed with a few fineliners, a blank sketchbook and a boatload of time, I set out to observe and experience the place of my dreams even deeper. To remember. To feel. To wonder. To appreciate it all the more". She initially had no plans to publish her art. Since the opportunity was presented by the Archivist at the Antarctic Legacy of South Africa (ALSA) to publish it in a coffee table book and the book launch took place in March 2020. The book consists of 49 sketches; including 3 poems depicting scenes experienced by Jess during her Antarctic Expedition. Only 100 publications are available. This poster will give an insight to Jess's experience and show some of the sketches.

## Mental Health In The Antarctic Confinement: A Monitoring Model

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The aim of the present study is to develop a model for monitoring the mental health of personnel stationed in Antarctic. Initial in loco data collection provided researchers with an important insight on living conditions and activities developed at each location. It lasted a period of eight weeks during the summer months. Information collected from civilian and military personnel was obtained using interviews, focus groups and self-administered questionnaires. Data is being analysed using a sociocultural perspective. Thus, compensating for the limitations arising from physical extremes and isolation, the exceptional opportunity of coexistence of researchers with a significant portion of the population focus of this study, consisting of individuals of different characteristics which, equally, are subjected to very different conditions of everyday life, allows confirming and generalizing hypotheses in relation to mental health and to seek to standardize more effective longitudinal monitoring system compared to current ones, in general based on mental disorders. Thus, in intersubjective contexts, in which social mediation by means of signs plays a crucial role, it is possible to study the psychic phenomenon in occurrence and recognize underlying processes resulting from the tension and struggle between the biological and the social, which we call the axis of Submission and Resistance, in which human action, on a case-by-case basis, is subjected to parameters of forced coexistence, strict rules, strenuous routines, restricted possibility of coming and going, and will be weighted by explicit resistance mechanisms and hidden responses that are reflected in a spectrum of psychophysiological and behavioral responses.

## Are Space and Polar Stations Really Analogous? A Comparison of Some Psychological Measures

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Although polar, and especially Antarctic, stations have long been considered analogues of long-duration space habitats, there is a growing body of literature examining that assumption. The implication is that data from one of the two ICES are generally predictive of what would be found if the study were replicated in that other. However, there are myriad differences between the single space station and polar stations, as well as among the many polar stations themselves that vary considerably in size, architecture, amenities, population, tasks, external and internal environment, etc. We have recently suggested that one way to test the analogy is to administer the same psychological tests in both settings. The current paper reports one result of this suggestion.

A current study of crews on the International Space Station includes the administration of measures of experienced stress, ways of coping, basic values, and personal changes in the individual from the time of training to post-return to the Earth. The results of this study will be compared with other measures of the same variables administered to crews in Antarctic and Arctic stations, as well as other space environments.

## “HABIT-ANT?” Is housing in Antarctica equivalent to inhabiting the place ?

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"HABIT-ANT?" is a scientific and citizens' initiative whose mission is to explore the interactions between humans and non-humans in a changing world in the particular context of the Southern and Antarctic zone. To do so, the global common model of Antarctica becomes a living laboratory that goes beyond the geographical location by involving people who are not there but are connected to the Southern and/or Antarctica. The link can be sensitive, poetic, scientific, managerial or any other type. The project is to design space-time that encourage the emergence of collective intelligence and serendipity. The project thus invites observation, dialogue and reflexive approach with tools from Environmental Sciences, Human and Social Sciences, artistic practice as well as Participatory Action Research in a world in metamorphosis.

The first part of this study consists in conducting an analysis of anthropized and protected sites such as the Kerguelen archipelago, the Crozet archipelago, the Amsterdam and Saint-Paul islands and Terre Adélie, through the prism of habitat. Occupied by man to house essentially "observatories" (scientific as well as political), these places are also home to an Antarctic culture, creating a contemporary heritage. It will be complemented by workshops conducted in remote sites to explore legacy, perceptions and representations associated with the Southern and Antarctica.

## Validating a sustainable Antarctic station design and as-built: A New Zealand custom sustainability accreditation tool.

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The New Zealand Antarctic Programme is currently designing a new Antarctic station, as the current station, Scott Base, has reached the end of its life. The Scott Base Redevelopment Project will be the largest construction project ever undertaken by New Zealand in Antarctica.

To demonstrate leadership in sustainability throughout the design and build process, a sustainability accreditation program that is both robust and specific for the Antarctic built environment was developed in collaboration with the New Zealand Green Building Council. A bespoke custom tool for a “Green Star” design and as-built accreditation scheme was the result.

The custom Green Star tool encourages practices that reduce the projects contribution to climate change, enhance the health and wellbeing of inhabitants, ensure high performance of buildings, and contribute to sustainable market transformation. The tool requires this project to reduce its embedded and operational environmental impact. Methods such as the implementation of Life Cycle Assessments (LCA) and greenhouse gas modelling with iterative improvements are incorporated in the tool.

To achieve accreditation, sustainable elements, environmental performance, and innovative solutions are incorporated into a station’s design. Sustainable elements and the delivery of Green Star are also included throughout the main contractor procurement process.

This presentation will delve into the development of this custom tool, strategies and opportunities Antarctica New Zealand have developed to minimise its impact from the construction of a new station, and some preliminary results from an LCA model. The potential for collaborative development of Antarctic sustainable rating systems and LCAs will be discussed.

## Turkish Polar Expedition behavioral evaluation program

Hayriye Elbi<sup>2</sup>, Cenan Hepdurgun<sup>2</sup>, Ozgun Ozalay<sup>2</sup>, Sebnem Pirildar<sup>2</sup>, Seren Kirmizi<sup>3</sup>, Fusun Saygili<sup>4</sup>, Utku Erdem Soyaltın<sup>4</sup>, Salih Tünbekici<sup>4</sup>, **Sinan Yirmibesoglu<sup>1,5</sup>**, Ozgun Otkar<sup>1,5</sup>, Burcu Ozsoy<sup>1,5</sup>

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Humans are highly adaptable to various conditions, but there are still questions that need to be worked through concerning effects of extreme climate conditions on human psychology. We developed an internet-based computer program for the psychological evaluation of the polar expeditioners and for the purpose of developing a training program for future expeditions. This information-support package will consist of psychosocial support videos with information on coping strategies, group interaction, team leadership, problem solving skills, impulse control skills and relaxation exercises based on experience from international studies and previous National Antarctic Science Expeditions participants. Data will be evaluated by 3 psychiatrists and 3 experienced polar scientists to gain an understanding for possible future conflicts that could interfere with future expedition work or well being of the group members. With the help of this knowledge, we are planning to improve our program to help researchers be better prepared for the expedition and to improve the safety and training program of the group. We are also planning to improve the program with human supervised machine learning which will be supported by bigger data sets from different groups such as high mountain climbers, and other groups working in extreme environments.

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## Logistics challenges of living and working in Antarctica

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Polar regions needs to be well known to better understand our future in every aspects. To reach and study those places, a well organized logistics strongly needed. Many countries had been working for many years with many experiences in the continent. With the developed technology and speed of reaching informations worldwide, make the expeditions safer and better planned. The consequences of expeditions which made by nations, were well examined to clearly understand logistic needs of polar expeditions before planning our own. Turkey had completed four successful Antarctic Scientific Expeditions (TAE) and established a research camp to operate between 2019-2022.

Turkish Scientific Research Camp had three modules which has laboratories, kitchen, living space and depot. The camp operates during summer seasons during our Antarctic campaign. We charter a vessel approximately for 30 – 35 days from Chile. The cargo of the expedition is also delivered to Punta Arenas. The vessel capacity with two helicopters, zodiac boats and barge is usually quite effective to carry on all logistic needs to the study area and the camp site. This study will indicate the challenges and coordination during the logistic activities of both scientists and general needs of living and working in Antarctica.

## Behavioral Evaluation of the Turkish Antarctic Expedition – IV Participants

Cenan Hepdurgun<sup>2</sup>, Hayriye Elbi<sup>2</sup>, Ozgun Ozalay<sup>2</sup>, Seren Kirmizi<sup>3</sup>, Sinan Yirmibesoglu<sup>1,4</sup>, Ozgun Otkar<sup>1,4</sup>, Burcu Ozsoy<sup>1,4</sup>, Sebnem Pirildar<sup>2</sup>

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Polar expeditioners often face various psychological challenges due to difficult environmental conditions, isolation and confinement. There are also positive psychological effects of participating in polar expeditions by means of coping successfully with stress, increased self-esteem and progress in personal development. Certain characteristics such as low susceptibility to anxiety and high motivation to achieve have been reported to be associated with better adjustment to short term expeditions. Therefore, identifying behavioral characteristics of the participants before the expeditions would be beneficial for developing prevention and intervention strategies prior to departure.

In addition to personal interviews held by two psychiatrists, we have evaluated 17 participants of the Turkish Antarctic Expedition – IV via the Temperament and Character Inventory, the Beck's Depression Inventory, the State – Trait Anxiety Inventory, the Resilience Scale for Adults and the Profile of Mood States. As expected, scores regarding anxiety and mood disturbances were below clinically significant levels for all of the participants. The mean scores of the Self-Directedness and the Cooperativeness subscales were significantly high while the mean score of the Harm Avoidance subscale was significantly low in Temperament and Character Inventory. A behavioral training program consisting of informative videos was prepared for participants considering group characteristics. Continuing behavioral and psychological evaluation for the further polar expeditions may help developing more personalized supportive strategies for expeditioners.

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