

Internship in ESA's Advanced Concepts Team
On
**Social psychology of past polar exploration as an analogue for future human
spaceflight**

European Space Research and Technology Centre
ESA ESTEC

Candidates interested are encouraged to visit the ESA website: www.esa.int/gsp/ACT/

Topic description

Good team interactions and crew morale are critical to the success of human spaceflight missions; this importance will only increase in future missions to the Moon and Mars. Data for the study of this problem (astronaut journals, mission logs, etc.) is however thin and difficult to obtain [1]. Polar expeditions and bases offer a good analog for astronaut social psychology due to commonalities such as shared isolation, long duration and dangerous environments [2]. Furthermore data from these expeditions is more populous and easily available.

In this project, we thus aim to parse through journals, logs and similar data from past polar exploration in order to extract observations useful to the study of the social psychology of future human spaceflight. We will do this by using Behavioural Sequence Analysis (BSA), a method previously applied to the study of complex social processes [3][4]. In BSA, behaviors observed in the data are first categorized manually, then analyzed statistically to find transitions between them that are occurring significantly above the level of chance. In this way e.g. the sequences of interactions that lead to problematic outcomes, and the responsible combination of personal interactions and operational procedures can be investigated for a given scenario, for example a team breakdown in an Antarctic base while overwintering. collection of such results will help with the further study of the social psychology of human spaceflight and with the design of such missions.

Candidate's tasks

Perform the BSA process on data from past polar exploration (journals, logs, etc.):

- categorize observed behaviors.
- list sequences between pairs of behaviors.
- perform statistical analysis of which transitions between behaviors are occurring significantly above the level of chance.
- create BSA graph based on the above results.
- document the process.

The ideal candidate

Mandatory:

- Experience with quantitative, statistical and/or computational methods in psychological analysis.

- Understanding of the psychology of isolated, confined and extreme (ICE) environments.

Desirable:

- Programming experience, ideally in Python.
- Familiarity with the history of polar exploration and human spaceflight.

References

[1] Blackwell Landon et al., Teamwork and Collaboration in Long-Duration Space Missions, NASA, 2018, <http://dx.doi.org/10.1037/amp0000260>

[2] Isolation studies in Antarctica, ESA webpage, https://www.esa.int/Science_Exploration/Human_and_Robotic_Exploration/Exploration/Isolation_studies_in_Antarctica

[3] ReBSA research group webpage, <http://www.rebsa.co.uk/>

[4] Marono and Keatley, A Behaviour Sequence Analysis of Nonverbal Communication and Deceit in Different Personality Clusters, 2017, https://www.researchgate.net/publication/316700952_A_Behaviour_Sequence_Analysis_of_Nonverbal_Communication_and_Deceit_in_Different_Personality_Clusters