



TriPolar

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Microbial Life in the Atmosphere as an Extreme Habitat

The atmosphere has been recognized as a possible habitat for microbial life with extreme conditions such as low temperature, low nutrient conditions, low pressure, high radiation levels, etc. Despite the harsh conditions we find microbial communities where active metabolism and reproduction is still possible. Within the Sparkling Science project TriPolar we want to characterize the microbial diversity and carbon content. Since alpine and polar areas act like sediment traps for bioaerosols the atmosphere is like an inoculum for oligotrophic environments such as ice and snow covered areas (MODUL AIR). To assess the carbon pool of this source in compared to present communities we want to develop a non-invasive technology to detect photosynthetic active pigments (phycoerythrin) in the ice matrix by laser induced fluorescent emission (L.I.F.E.). This method could provide a promising tool to estimate the phototrophic biomass in a high resolution by an airborne application (mounting of a 532nm laser onto a model helicopter) (MODUL L.I.F.E.).

In general, working in ultra-oligotrophic environments requires a high level of sterile working conditions for sampling campaigns. Hence, potential contamination vectors must be reduced substantially. This requirement is valid for the investigation of the cryosphere as well as for analogue research on exoplanets. Within TriPolar we intend to mimic sampling procedures with known forward and backward contamination vectors to assess the quality of sampling methods and devices (MODUL SPACE).

Schools of different types will be directly involved in investigations within the three modules. Beside ecological studies and technical developments they will have to cooperate with international partners to train their language competence by compiling contributions for scientific publications and conferences.

Team:

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Schools

1. HS Zirl, Tirol
2. BG/BRG Lilienfeld, Niederösterreich
3. Land- und Sporthauptschule Königsweg, Tirol
4. HTL Eisenstadt, Burgenland

Scientific partners

1. Zentralanstalt für Meteorologie und Geodynamik (ZAMG), Wien
2. Österreichisches Weltraumforum, Büro Innsbruck, Tirol
3. Universität Wien, Department für Limnologie und Hydrobotanik
4. Universität Innsbruck, Büro für Öffentlichkeitsarbeit, Tirol

Project duration

01. Oktober 2010 – 31. März 2013