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University of Lausanne



Luminescence sampling SSC sampling

Dye tracing Time Lapse cameras 2.5 2500 2.0 2000 🖯 Ê 1.5





2022-06-01 2022-06-15 2022-07-01 2022-07-15 2022-08-01 2022-08-15 Date







Marjolein Gevers (marjolein.gevers@unil.ch), Stuart Lane, Floreana Miesen, Davide Mancini, Matthew Jenkin, Chloé Bouscary, Faye Perchanok, Georgina King, Leif Anderson, Ian Delaney

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0.5 0

2022-05-15

Swiss National

1500 ≥

1000.

2022-09-01 2022-09-15

SWISS POLAR Science Foundation INSTITUTE



University of Basel



Filling the high-Arctic gap in European-wide plant re-distribution during the Anthropocene

Sabine Rumpf University of Basel

Background

- Exponential environmental changes
- Species re-distributions
- Responses assumed linear

<u>Data</u>

- >4,000 re-surveys
- Multiple observations
 - 124 plots & 7 summits on Svalbard

<u>Aims</u>
1) Acceleration of range shifts
2) Accumulation of extinction debts & colonization credits
3) Contribution of individual drivers

Picture: University of Basel / Marcel Schütz



University of Zurich





Artificial light at night reveals hotspots and rapid development of industrial activity in the terrestrial Arctic from 1992 to 2013



Authors: Cengiz Akandil, Elena Plekhanova, Nils Rietze, Jacqueline Oehri, Miguel O. Román, Zhuosen Wang, Volker Radeloff, Gabriela Schaepman-Strub

Sascha Hardegger

Dufour Aerospace



Dufour Aerospace "AeroMini" - Drone support for research

Our mission:

- AeroMini is potentially a perfect tool for sensor and logistics applications in research, data gathering environments.
- Together with "The Arc" we are looking for interested partners for further development and field testing.

The problem we are solving:

- Not just "another small drone", but a highly adaptable, long-range, multi-purpose VTOL drone.
- Serving as an internal test-platform today, we have been working with it for several years.
- We are looking for industry or research use partners to finalize it with a view to specific use cases.

The next version:

- High level requirements: Payload 3 to 5 kg, 90 minutes of fligh time, 150 km of range, BVLOS flight in challenging environments
- No additional infrastructure required
- Highly adaptable payload concept, easy payload integration
- Easy to field deploy and modular to repair





ETHZ





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David Touchette, Elizaveta Sharaborova and Vincent Haagmans







- Undergraduate student
- Master student
- PhD student/candidate
- Postdoctoral researcher
- Scientist

30.8%

- Faculty member
- Industry member
- research assistant
- PhD applications in process





ZHAW





Liquid Water Storage System for Subzero Temperatures



Water + phytantriol remains liquid down to -120°C (ETHZ)

Pumping/hydraulic networks possible. No heating req'd for storage. Water that never freezes

- 24 APR 2019



Three-dimensional model of the novel lipid mesophase (Photo: Peter Rüegg/ETH Zürich)



Idea 2: Combine w/ water recycling units: Closed-loop centralized water storage & supply systems for cold

Idea 1: Use for lunar &

planetary base life support





regions



Liquid Water Storage System for Subzero Temperatures

Proposal: Design a closed-loop liquid water storage and supply system for cold areas

- Water quality control inherent in system when coupled to recycling unit
- Freshwater supply independent of
 - Weather
 - Season
 - Temperature
 - Availability of natural resources
 - Availability of infrastructure (roads, piping, etc.)
- Can be powered by renewable energy
- Addresses UN SDG 6, targets 6.1, 6.2 & 6.3

Patent application pending, »System for the storage of liquid water at temperatures below the freezing point", CH00798/2022, patent priority date July 4th, 2022

Points of Contact:

Dr. Marius C. Banica ZHAW IEFE banc@zhaw.ch

Dr. Matteo Madi Sirin Orbital Systems madi@sirin-os.com

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University of Bern





Cardiac Arrhythmia in Climbers on Mount Everest

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UNIVERSITÄT

RERN

Sherpa K, Sherpa PP, Sherpa T, Rothenbühler M, **Ryffel C**, Sherpa D, Sherpa DR, Sherchand O, Galuszka O, Reichlin T, Pilgrim T National Academy of Medical Sciences, Nepal; Seven Summit Treks, Nepal; Bern University Hospital, Switzerland





PSI





Exploring new molecular universes



The knowledge of what surrounds us is limited by the tools we use



Past climate understanding limited by the analytics adopted so far



Focus mainly on inorganics and few organic compounds



Janneke van Ginkel

ETHZ



SWISS POLAR INSTITUTE POLAR ACCESS FUND Illuminating the subglacial environment of Greenland's fastest outlet glacier with passive seismic techniques

ETH

wiss Federal Institute

for Forest, Snow and Landscape Research

University of Zurich[™]

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Janneke van Ginkel^{1,2}, Ana Nap³, Martin Lüthi³, Antoine Zaninetti¹





University of Lausanne





Dendrochronological fieldwork in the Eastern Himalayas

to understand changes to water resources and natural hazards in the context of climate change

Nazimul Islam[™], Torsten Vennemann and Stuart Lane



Institute of Earth Surface Dynamics (IDYST), University of Lausanne, Switzerland (<u>Mazimul.islam@unil.ch</u>)

Sampling sites

Challenges

Tree coring



- Upper Teesta (2080 km²) and Lachung Chu (825 km²) catchments
- Himalayan larch (Larix graffithiana) and Bhutan fir (Abies densa) tree species
- Two cores per tree located at the proximity to the river and at the distal to the river
- Developed 182 years (1840-2021) long chronology of ring-width indices (RWI) in the UT catchment
- •Reconstructed 180 years (1841-2020) of May discharge in the Zemu River
- •Disturbances in tree ring growth aftermath of landslide events in 2011 and in 2015

UNIL | Université de Lausanne



ALPWISE

nine Environments: Water, Ice, Sediments and Ecolog









SWISS POLAR

INSTITUTE







Swiss Polar Day September 15, 2023,



University of Zurich, ETHZ









Juneau Icefield Research Program 2022











ETHZ



When it was formed the icecap in Antarctica?

Joaquin Bastias-Silva



If Earth's history were condensed into 24 hours, land plants would have appear at 9:52 pm, dinosaur extinction at 11:41 pm, and human history would have begun at 11:58 pm.

ETH zürich





When it was formed the icecap in Antarctica?

Joaquin Bastias-Silva

Swiss National

Science Foundation





Thanks!





Zircon minerals will help us to determinate the age of Antarctica's glaciation



Nous Prod





Season 1 : almost 2.2 M cumulative views



Poisson Fécond : 3.3 M followers





Season 1 subjects:

Link between pollution and climate change Comparing planes and long-distance trains Heating a city with Co2 Eco-anxiety Electric cars versus thermal cars The collapse of society

Season 2 x upcoming topics:

Swiss glaciers and/or the Arctic Energy mix Living with an extra 5 degrees Samsø Sustainable tourism



of views: 655k

Denyzee : 2.5 M followers



University of Basel



Tracking dissolved methane in the fjords of the East Greenland coast On board *MV* Nansen Explorer



Sampling sites obtained during the cruise, more coastal/fjord than planned. *Colors indicate the speed of melting glacier, from Qgreenland.*



Dissolved methane sampled for methane isotopes



Land-terminating glacier near Kangerdlugssuaq

Initial objective: Do fjord to offshore transects to know how much methane is exported in the ocean

Revised objective: Focus on fjords and fjord outflows due to logistical reason (max. 5 naut. Miles away from the coast)

- \Rightarrow 15 stations sampled for dissolved methane, extra surface sediments for 14C dating (new collaboration)
- \Rightarrow Extra sampling for GreenFjords afterwards



Sampling for ancillaries: POC, DIC, DOC, water iso. With N. Zwerschke, Greenland Institute for Natural Resources