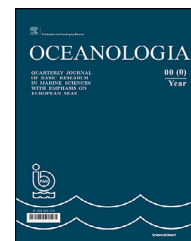




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ORIGINAL RESEARCH ARTICLE

Punk's not dead, even at the Czech Arctic Scientific Station in Svalbard

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Summary In the last few years, the newly opened Czech Arctic Scientific Infrastructure in Svalbard – Josef Svoboda Station – has closely collaborated with UiT – The Arctic University of Norway on very productive research related to climate change and the impact of the sea and land ice disappearance. Professor Josef Elster, the Head of the Czech station and a researcher in the diversity, ecology and ecophysiology of polar algae and cyanobacteria, and the glacial microbiologist Marie Šabacká and their team try to find the answer to questions concerning how the Arctic ecosystem responds to global warming and how global warming affects human activity. The results of their research can be used, for example, in the treatment and refinement of drinking and sewage water, the pharmaceutical industry and medicine, livestock nutrition including aquaculture and in the production of nutritional supplements for people. However, even the most exciting scientific information and results are not readily available to a non-professional audience. Interdisciplinarity and a suitable cultural framework can bring new life to the results of scientific research. If the presentation of science is interconnected with cultural disciplines such as literature, art, music or theatre, its account can be enriched and media interest can be increased. The scientific-cultural festivals AT HOME IN SVALBARD 2018 and ARCTIC FESTIVAL 2019 are just two good examples. The presentation of scientific research through culture is a very distinctive and innovative attempt. Moreover, the interest of the public can

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influence the stakeholders' approach to providing and increasing finances for further scientific research.

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1. Czech Arctic Scientific Infrastructure

A research group of scientists from the University of South Bohemia in České Budějovice operates in the Arctic archipelago of Svalbard, where they, in the period 2010–2015, with the support of the Czech Ministry of Education, established the Czech Arctic Scientific Infrastructure – Josef Svoboda Station. The station bears the name of a political prisoner of the 1950s who went into exile in Canada in 1968, where he contributed significantly to the elucidation of the ecological and plant ecological patterns of the Arctic. Josef Svoboda is one of the founders of Czech polar research.

The following units form the Josef Svoboda Station: the Centre for Polar Ecology at the Faculty of Science of the University of South Bohemia in České Budějovice (CPE), the Julius Payer House at the Svalbard administrative centre of Longyearbyen, “Nostoc” Field Station in the south-west part of the archipelago and the motorsailer “Clione”, which sails between “Nostoc” and Longyearbyen. The most important Czech scientific base at Longyearbyen – the Julius Payer House – got its name after the greatest Arctic researcher from the Czech lands (he was born in Teplice), the discoverer of Franz Joseph Land and the most famous realistic painter of polar landscapes in general.

2. Polar research of professor Josef Elster and his team

The main force in establishing the Czech Arctic Scientific Infrastructure “Josef Svoboda Station” was Professor Josef Elster. He participated in British, Polish, Belgian, Japanese and several Czech expeditions to various parts of Antarctica (altogether 9 expeditions). He completed 27 Arctic expeditions (including the Canadian, Japanese, Norwegian and Polish ones), of which four took place in winter.

Josef Elster is a researcher in the diversity, ecology and ecophysiology of polar algae and cyanobacteria. In his research, he focuses on several topics related to the ecological role of photosynthetic microorganisms in the polar environment, e.g. winter survival strategies, and reconstructing living conditions in polar lakes and soil surfaces (so-called biological soil crusts). The reconstruction of past and current conditions can be used to predict how these biological systems will behave under the pressure of climate change – for example, what happens in the Arctic when all glaciers melt, the “Arctic Greening”.

Josef Elster has close collaborations with, for example, the glacial microbiologist Marie Šabacká from the Centre for Polar Ecology. Marie uses a combination of genomic analyses, ecosystem production measurements and nutri-

ent cycling in order to create a comprehensive picture of glaciers as ecosystems (where the energy comes from, how it passes through the system, which organisms live there, what substances they produce, etc.). She integrates this information into a global context by comparing glaciers from the tropics to those in the polar regions. In her research, Marie has described the unknown diversity and productivity of African glaciers. By comparing them with temperate and polar glaciers, she hopes to determine whether tropical glaciers are just the southernmost outposts of large polar ecosystems or host unique and isolated communities. Finally, yet importantly, she is interested in how individual organisms have colonised these glaciers and whether their expansion has followed glacier movements since the last ice age.

Josef Elster and his team currently focus primarily on the two most important issues related to the development of the Arctic ecosystem: How the Arctic ecosystem responds to global warming and how global warming affects human activity. The results of their research can be used, for example, in the treatment and refinement of drinking and sewage water, the pharmaceutical industry and medicine, livestock nutrition including aquaculture and in the production of nutritional supplements for people.

The Czech Arctic Scientific Infrastructure offers a unique opportunity to study local organisms all year round. It is a new topic in ecology in general, gaining in importance with climate change. Winter thaws have recently become more frequent in Svalbard with temperatures reaching above zero during the polar night, resulting in the melting of the tundra for a short time and its subsequent refreezing. The Czech scientists are currently preparing a project that will measure how individual organisms prepare for winter, how they behave in winter and how they subsequently react to the arrival of spring.

There has been close collaboration in the last few years between the Josef Svoboda Station and UiT – The Arctic University of Norway (Department of Arctic and Marine Biology, Tromsø, Norway) at the Billefjorden area (the northern tip of the Isfjorden where the Czech field station “Nostoc” is located). This collaboration has led to very productive research related to climate change and the impact of the sea and land ice disappearance.

Different forms of freshwater impacts, including the melting of glaciers, influence the Arctic fjord systems. Freshwater inflow leads to unique physical and biological patterns, which vary drastically in temporal and spatial ranges. Glaciers are retreating and melting, consequently, freshwater inflow is increasing. Climate change has also impacted the landscape in terms of the loss of sea ice. No one knows how the marine ecosystem will respond to such changes in terms of land-ocean interactions, biogeochemistry, diversity and food web interactions. In the

Svalbard archipelago, several research teams have studied the changes in marine fjords ecosystems. One team, led by the Norwegian Polar Institute, UiT – The Arctic University of Norway, Tromsø and Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research, Bremerhaven, Germany, studied the ecosystem of Kongsfjorden near Ny-Ålesund for many years (see [Hop et Wiencke, 2019](#)). A second team, led by the Institute of Oceanology, the Polish Academy of Sciences, Sopot, Poland, studied the fjord system in the Hornsund area, where the Polish research station is located ([Garcia-Soto et al., 2019](#), [Grabowski et al., 2019](#), and many others).

Near the Czech field station “Nostoc” (the north tip of Isfjorden, Billefjorden, the Central part of Svalbard), there is a wide spectrum of glaciers (from almost disappearing small valley glaciers to large ice sheets). The diversity and abundance of microbes (from viruses to invertebrates, the whole food chain) living in these glaciers in all parts (subglacial, inglacial, supraglacial) is more or less unknown. During the melting of the glaciers, most of the organic carbon developed and stored in the glacial bodies, together with mineral nutrients accumulated in microbial cells, is transported by melting water to the terrestrial and/or marine ecosystem. Meltwater together with silt, organic carbon, microbial inoculum and mineral nutrients are inserted to the marine ecosystem by glacial stream/rivers or can be transported directly to the seawater by direct ice calving. How are these waters, minerals, organic carbon, and microbial inoculum utilized in the sea ecosystem? How do these inputs influence the marine ecosystem and the marine food chain? Based on Czech research experiences in terrestrial and glacial microbiology (e.g. [Vonnahme et al., 2016](#)), the UiT – The Arctic University of Norway, Tromsø began research collaboration at the Billefjorden area. Billefjorden is a tidewater outlet glacier in Svalbard at the end of Isfjorden. It is seasonally ice-covered and protected from Atlantic inflow by a shallow (ca 40 m) sill at the entrance of the fjord. The fjord receives freshwater inputs from larger rivers, fed by land-terminating glaciers and the tidewater outlet glacier ([Vonnahme et al., 2019](#)). Based on these ecological features, Billefjorden differs from previously studied Svalbard fjords. Its detailed study is a very urgent task for understanding the processes related to climate change and ‘Atlantification’ of the high Arctic fjord ecosystem.

3. Science and culture – a new approach to science communication

The above-mentioned results of Czech Arctic research in light of new global challenges, such as climate change and food security, are surely succeeding very well internationally, thanks in part to the newly established Czech Arctic Scientific Infrastructure in Svalbard. Now, the scientists have to use science communication to raise awareness of their achievements, to inform their potential partners, and domestic and foreign publics. The ‘inreach’ or expert to expert communication, i.e. scholarly communication and publication in scientific journals, may not be enough. Outreach science communication, typically consisting of professional scientists speaking to non-expert audiences, is to-

day more and more appreciated. Science communicators can use culture, entertainment and humour, storytelling and metaphors, as seen for example in the FameLab project – an international science communication competition organized in 31 countries to find and support the world’s most talented science communicators. Participants have three minutes to win over the judges and audience with a scientific talk that excels for its content, clarity and charisma.

Such an undogmatic approach to science communication can be supported by the theory of multiple intelligences ([Gardner, 1983; 1993](#)), which describes eight different abilities (intelligence modalities) of a human’s brain. Apart from the logical-mathematical ability (intelligence modality) of a scientist, his/her visual-spatial and musical-rhythmic and harmonic abilities (‘artistic’ or ‘creative’ intelligence modalities) can be used as well.

Today’s widely used term is interdisciplinarity. The interconnection of science and culture on the basis of a common theme or interest can be very interesting. For example, researchers examine the patterns of ice movement and their environmental impact, the occurrence of microorganisms in the northernmost part of the world, etc. An artist dealing with the same subject may be interested in the symbolism of melting and ephemerality; he or she can defend the environment by artistic means and mediate a certain philosophical or metaphysical approach to this theme. Through an artistic experience or dialogue with artists, fact-centered scientists focused on data collecting and cataloguing, can discover another legitimacy of their work, a kind of intangible encouragement, a sense of belonging to human emotions and desires. An artist, on the other hand, can learn many details about a given topic and find more associations and symbolism in them. He or she can also be inspired by the enthusiasm for revealing the unknown, by systematic and persistent approaches, conceptualism and erudition, which are, after all, common features of both scientists and artists.

There is a very effective way how to make exciting scientific information and results available to a non-professional public – organizing scientific-cultural festivals. Such festivals are great opportunities for looking at the activities of both scientists and artists from different angles. Moreover, such festivals – or cultural events themselves – can increase media interest in scientific research and make science more visible and understandable to a broader audience as evidenced by the following examples.

4. At Home in Svalbard 2018

The cultural and scientific festival AT HOME IN SVALBARD 2018 took place from 21 August to 13 September 2018 at Longyearbyen, the Svalbard administrative centre, and in the former Russian mining town of Pyramida. It was held in honour of the 100th anniversary of Czechoslovakia, the 25th anniversary of the Czech Republic’s establishment and the 10th anniversary of regular research stays of Czech scientists in Svalbard. The Festival was named after the focal point of the whole event – a concert by the avant-garde punk-rock band “Už jsme doma/UJD” (Already at Home) and the release of their new CD entitled *Floes*. The project, also called the Days of Czech Science and Culture, was held in cooperation with Svalbard partners. The following

exhibitions, lectures and cultural performances formed the Festival's programme:

The scientific part of the project culminated on 6–8 September 2018 in a scientific conference at the premises of the University of Svalbard (UNIS) hosted by its Managing Director, Harald Ellingsen. The opening speeches were delivered by Tomáš Machula, Rector of the University of South Bohemia, František Vácha, Dean of the Faculty of Science of the University of South Bohemia, Kim Holmén, International Director of the Norwegian Polar Institute, Josef Elster, Director of the Centre for Polar Ecology of the University of South Bohemia, Zdeněk Lyčka from the Czech Ministry of Foreign Affairs and Miroslav Wanek, leader of the punk-rock band UJD. The presentations of twelve lecturers took place at UNIS, at the Julius Payer House (part of the Josef Svoboda Station in Svalbard) and at the Svalbard Church (all at Longyearbyen).

The cultural part of the project consisted of several events. The project by artists from the Academy of Arts, Architecture and Design in Prague (UMPRUM) called *Three Women: Art Objects in Space* was presented at Longyearbyen (Dana Elsterová: *Flying Message*, Anna Leschingerová: *Luminous Chime* and Anežka Podzemská: *Beams of the Midnight Sun*). At the Svalbard Gallery, illustrations accompanying the Czech translation of Inuit myths and legends by Martin Velišek were exhibited from 21 August to 13 September (the festive opening with the author's presence took place on 7 September). At the same time, Luboš Drtina's illustrations accompanying the Czech translation of Saami fairy tales and legends were exhibited at the Svalbard Church (the opening took place on 7 September).

The theatre group "Buchty a loutky/Cakes and Puppets" led a workshop for children from two local kindergartens and the art school with the aim to prepare stage properties for the musical-puppet show *Five Hits to a Hat*, which took place on 8 September at the HUSET Culture Centre. The theatre piece was performed in Norwegian, including the accompanying text by Zdeněk Lyčka and songs by UJD sung by the Norwegian singer Stefan Lindal Theofilakis.

On 8 September, UJD performed a concert at the HUSET Culture Centre. This event was the cultural culmination of the Days of Czech Science and Culture. During the evening, a new CD by UJD entitled *Floes* was launched. The following day, UJD played two mini-concerts at the Culture House and at the Tulip Hotel in the former Russian mining town of Pyramida, northeast of Longyearbyen.

The Czech media was keenly interested in Czech Science and Culture Days. Czech Television broadcast reports on 9 and 26 September in "Events in Culture" ([Czech Television, 2018](#)), other media outputs took place in dailies, weeklies, magazines and on the Internet. Based on media responses, Czech Television started shooting a documentary that would raise awareness of the international work of Czech scientists in Svalbard.

5. Arctic Festival 2019

From November 2019 to January 2020, a reciprocal continuation of the above-mentioned cultural-scientific project took place in the Czech Republic (Prague, České Budějovice, Teplice and Plzeň) under the name of ARCTIC FESTIVAL 2019,

or the Days of Arctic and Czech Culture and Science. The main aim of the festival was to make a follow-up to the 2018 event in Svalbard, deepen the acquired contacts and to start cooperation between new partners. The Czech public became acquainted with the achievements of Nordic and Czech scientists in Arctic research, the culture and history of the Arctic nations, and with joint Czech-Arctic cultural and scientific activities in Czechia and the Arctic. In addition to being introduced to the core points of the AT HOME IN SVALBARD 2018 project, the Czech professional audience, the public and all interested people in Czechia had the possibility to enjoy the unique Arctic culture from Svalbard, Lapland, Greenland, Norway and Denmark.

The official opening of the Festival took place at Charles University's Carolinum on 7 November. The speakers were: Josef Elster, Head of the Centre for Polar Ecology, University of South Bohemia, Harald Ellingsen, Managing Director of UNIS at Longyearbyen, Robert Kvile, Ambassador of Norway to the Czech Republic, Jan Dusík, Principal Adviser, UNEP, and Zdeněk Lyčka, Ministry of Foreign Affairs of the Czech Republic. The Festival opening was completed by a short musical performance by the Inuit shaman Hivshu.

The scientific part of the Festival began at the Municipal Library of Prague on 7 November 2019 with a lecture by Zdeněk Lyčka (MFA) called *Canadian Inuits as part of the original Inuit people and the beginnings of the Inuit literature in Canada*, followed by the screening of the Canadian documentary *If the Weather Permits*.

The scientific conference continued on 8 November on the premises of Charles University with the following lectures in English simultaneously interpreted into Czech: *Arctic Environment: global asset, global victim or global danger?* by Jan Dusík (Principal Adviser, UNEP), *Czechoslovak/Czech science in the Arctic and the role of the University of South Bohemia* by Hana Šantrůčková (Dean of the Faculty of Science, University of South Bohemia), *Czech Arctic Research Infrastructure "Josef Svoboda Station" in Svalbard; Scientific and Cultural Embassy in the Arctic* by Josef Elster (Director, Centre for Polar Ecology, University of South Bohemia), *Science in a changing environment* by Harald Ellingsen (Managing Director, UNIS, Longyearbyen), *Svalbard: Nature in rapid transformation with a changing climate* by Kim Holmén (International Director, Norwegian Polar Institute, Longyearbyen), *The Arctic in Norway: Between Politics and Identity* by Pål Wilter Skedsmo (Fridtjof Nansen Institute, Oslo) and *Vikings in the North Atlantic and the Norse in Greenland: demise of a Christian community* by Naja Mikkelsen (GEUS, Copenhagen).

The following lectures were delivered in Czech: *Czech Antarctic Scientific Infrastructure* by Peter Váczi (Masaryk University, Brno), *The involvement of the Czech Arctic Scientific Infrastructure in the international INTER-ACT project* by Alexandra Bernardová (CPE), *International law in the Arctic* by Vladimír Balaš (Charles University, Prague), *Arctic Geopolitics and its importance in International Relations* by Barbora Padrtová (Masaryk University, Brno) and *Denmark's relations to Greenland and the Faroe Islands: Postcolonial authority or partner on the way to independence?* by Adam Kočí (University of Ostrava).

The afternoon scientific programme continued at the Gallery of the Czech Centres with the screening of the film *Polar Ecology* with a commentary by Václav Pavel (CPE), and

the following popular lectures in Czech: *Artscape Norway* by Dan Merta (Jaroslav Fragner Gallery, Prague), *Mission of the Moravian Church in Greenland* by Daniel Freitinger (evangelic pastor, Domažlice), *Coexistence of Aleuts and Alutiqs with Inuits* by Stanislav Chládek (USA), *Julius Payer, a Great Guy from Šanov* by Jitka Bažantová (Regional Museum in Teplice and the Society of Friends of Julius Payer) and *Crossing Greenland on skis* by Zdeněk Lyčka (MFA). (All abstracts in English and Czech are available at [CPE's web site, 2019](#).)

The set of lectures ended on 11 November at the Institute of Geophysics of the Czech Academy of Sciences with the lecture *Julius Payer – Starvation Cove* by Jitka Bažantová (Regional Museum in Teplice and the Society of Friends of Julius Payer) and a public viewing of Julius Payer's original painting “*Starvation Cove*” (1897).

The cultural part of the Festival consisted of several events. On 7 November, four exhibitions were officially opened at the Gallery of the Czech Centres: the panel exhibition *Czechia in the Arctic/The Arctic in Czechia*, the photo exhibition *Canada's Arctic – Vibrant and Thriving*, the photo exhibition *3913 Tasiilaq* from East Greenland by Ole G. Jensen and *Landart Objects* by “Three Women” from the Academy of Arts, Architecture and Design in Prague (UMPRUM): Dana Elsterová, Anna Leschingerová and Anežka Podzemská. All exhibitions were shown at the Gallery until 16 November. The exhibition part of the Festival was accompanied by a film presentation on melting icebergs by Bjørn Anders Nymoen (Svalbard), the photo presentation *South Bering Sea Animals* by Stanislav Chládek (USA) and by the video presentation *Artscape Norway* on Norwegian architecture. On 9 November, two other Arctic exhibitions were opened at the Archa Theatre as part of the theatre, literary and music events of the Festival: *Saami Fairy Tales and Legends/Illustrations* by Luboš Drtina and *Greenlandic Myths and Legends/Illustrations* by Martin Velišek. Later, some of these exhibitions were shown at the Regional Museum in Teplice, the birth city of Julius Payer, at the University of South Bohemia in České Budějovice and at Europa House Gallery in Plzeň.

At the Archa Theatre, the theatre group “Buchty a loutky/Cakes and Puppets” together with the music group “Už jsme doma/UJD” performed two musical-puppet shows *Five Hits to a Hat* – one in Norwegian with the Norwegian singer Stefan Lindal Theofilakis, the second one in Czech, on 9 November.

Three literary events also took place at the Archa Theatre on 9 November: A literary debate with the Norwegian writer Monica Kristensen, the presentation of a new edition of the book issued on the 150th anniversary of Julius Payer's birth and a re-edition of the Czech translation of his book *The North Pole Expedition*, and the presentation of the Czech translation of the novel *HOMO sapienne* by the contemporary Inuit writer Niviaq Korneliussen.

Evening concerts by the Inuit shaman Hivshu, the music group Vassvik from Sápmi/Lapland and by the B.A. Nymoen music group Kapp Mitra from Svalbard were the cultural highlights of the Festival at the Archa Theatre.

The last but not least cultural event of the Festival was the screening of Arctic films realized together with the Nordic Film Club's *Nordic Film Autumn* in Prague (Institute of Germanic Studies, Municipal Library, Evald Cinema, Pon-

repo Cinema and Lucerna Cinema) and 13 other cities and towns in Czechia.

ARCTIC FESTIVAL 2019 was organized by the Centre for Polar Ecology of the University of South Bohemia in České Budějovice in cooperation with UNIS in Longyearbyen and with the financial support of the Fund for Bilateral Relations within the EEA and Norway Grants 2014–2021. Other international cooperating partners included the Embassy of Norway in Prague, the Embassy of Canada in Prague, the Embassy of Denmark in Prague, the Embassy of Finland in Prague, the Norwegian Polar Institute and the Fridtjof Nansen Institute. Czech Television broadcast interviews with the Festival's speakers Jan Dusík, Harald Ellingsen and Josef Elster. On 8 November, Zdeněk Lyčka was invited to the Czech TV studio for a morning interview about the Arctic Festival ([Czech Television, November 2019](#)). Zdeněk Lyčka was also a guest in a live broadcast of Czech Radio. The French section of Radio Prague International broadcast long interviews with Jan Dusík and Zdeněk Lyčka, and an article was published on the French section's internet site ([Radio Prague International, 2019](#)). Other media outputs included an article in the daily Lidové noviny on 9 November, and exposure on Czech TV ([Czech Television, December 2019](#)) and Czech Radio ([Czech Radio, 2019](#)). Czech Television continues shooting the documentary on the international work of Czech scientists in Svalbard.

6. Conclusion

It turns out that the presentation of scientific research through culture is not a purposeless scream to the darkness, but rather a very distinctive and innovative achievement. Even the most serious scientific results do not often hold the attention of the non-professional public for a very long time if they ever reach them. People must continually struggle with the overpressure of new or constantly recycled information coming to them from media, social networks and through the generally accelerated pace of life. If science is interconnected with a cultural discipline, such as literature, art, music or theatre, its account can be enriched. A suitable cultural framework can bring new life to the results of scientific research. That, in exceptional cases, can evoke such a strong experience that people who have yet had very little or no awareness of science may become interested in it.

In 2018, a group of 30 Czech cultural tourists, mostly followers of the UJD band, arrived in Svalbard for joining the launch of the band's new CD. During their stay at Longyearbyen, the Czech group also attended the scientific part of the AT HOME IN SVALBARD 2018 project – the scientific conference at UNIS, the Julius Payer House and the Svalbard Church. In this way, people who had no idea of Arctic science had the possibility to follow the efforts of Czech scientists in collaboration with their Norwegian partners.

The Czech Television broadcast and other Czech media outputs in dailies, weeklies, magazines and on the Internet were focused both on the cultural and scientific points of the Festival, i. e. they attracted the attention of both scientists and culture-oriented audiences.

A very important part of the ARCTIC FESTIVAL 2019 was the Arctic Film Festival, which focused both on

documentaries and feature films, and thus spread both special knowledge/expertise and culture. Some of the exhibitions depicted both scientific and cultural points of the Festival, e. g. “Czechia in the Arctic/The Arctic in Czechia” or “Julius Payer and the Legends of Far North”. B.A. Nymoen’s video presentation focused on the environment. The scientific and cultural themes of the conference attracted the attention of both the specialized and non-professional public, as well as television and radio broadcasts.

It is not possible to judge the non-professional public’s interest in polar issues, but the TV scientific-cultural broadcast in prime time certainly helped broaden the audience’s perception.

Scientific-cultural festivals are not just about the programme, but also about meetings between scientists and artists – like science conferences or art workshops. Moreover, the interest of the public can influence the stakeholders’ approach to providing and increasing finances for further scientific research.

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