



The development of the northern lights tourism network

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ABSTRACT

Drawing on actor-network theory (ANT), we trace the translations and ordering processes underlying the fast-growing northern lights tourism network in northern Norway. It also shows how the outbreak of the COVID-19 pandemic, from March 2020, represented the most severe market shock. The results, following a multi-methods qualitative approach, unpack how this network emerged, accelerated and matured through diverse processes and practices, involving human and non-human actors. The study illustrates how elusive natural phenomena can become successful tourism attractions, but also that they may include vulnerabilities, when facing hostile actors. The study describes how the COVID-19 pandemic interrupted the northern lights tourism network, and how the Norwegian government, through authoritarian and assistive measures and regulations, contributed to and mitigated this interruption.

What is the contribution to knowledge, theory, policy or practice offered by the paper?

The paper's contribution is to increase our understanding of how relations establish structures that are a unity—an entity of itself, through an exploration of the emergence, acceleration and disruption of the northern lights tourism network. It illustrates the messiness of addressing micro- and macro-level processes and how they are linked, when investigating the complexities of developing and maintaining tourism attractions. For the industry, this study can increase our understanding of how one natural phenomenon can be translated and ordered into becoming a tourism attraction. Other natural phenomena have the same capability to become tourism attractions, if actors are willing to work with them. Our research also demonstrates the value of Actor Network Theory, not only for historical analyses of the development of tourism systems but also for future-oriented purposes.

How does the paper offer a social science perspective/approach?

Through the social science approach Actor Network theory (ANT), this paper unpacks the emergence, acceleration and disruption of the northern lights tourism network. The emphasis is on the ANT notions of translation and ordering. Successful translations create ordering materialised as plans, devices, organizations and much more. Ordering is useful for revealing the translations it stems from. Therein lies the possibility to learn how a natural phenomenon can work together with industry people, tourists, buses, cameras, advertising stickers, marketing schemes and other actors. In line with ANT, the paper abolishes the differentiation of humans and non-humans and deals with both on equal

terms.

1. Introduction

This study will use an ANT framework (Latour, 2005; Ren, Jóhannesson, & van der Duim, 2012) to unpack the development of the northern lights tourism network in Tromsø and Alta, northern Norway. The northern lights took centre stage in Norway's tourism through the impressive establishment and continuous development of relationships and networks. We will explore the key factors and actors that served to facilitate their growth from a niche to a growing global market (cf. Heimtun, Jóhannesson, & Tuulentie, 2014; Heimtun & Lovelock, 2017). Until March 2020, northern lights tourism had presented itself as a strong and taken-for-granted unit of established companies and businesses (cf. Innvasjon Norge, 2019; van der Duim, 2005). The future looked bright, with prognoses of increasingly marked interest. There were few challenges until COVID-19 intervened.

The pandemic and the need to enforce public health strategies against it clearly interrupted businesses, systems, and networks worldwide, including the northern lights tourism network. The virus acts like malware on a computer, effectively stopping processes and changing behaviour (Balzacq & Cavelty, 2016). It challenges the consistency of a network and forces actors to enact other practices and translations. We will therefore also briefly disentangle how the pandemic interrupted the northern lights tourism network and how governmental infection prevention measures and financial interventions further affected this

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interruption. The pandemic made the actors and their relationships visible again, in the sense of depunctualisation (van der Duim, 2005); the network, which was perceived as a unity, thus suddenly again revealed its contents. With this opening of the black box of northern lights tourism, the bits and pieces of the network became available for investigation (Law, 1992).

When unpacking the translations in the studied network, the researchers made translations towards an ordering in the form of a text (Latour, 1987). ANT does not require that this ordering must follow the detected translations in time and place when presented in another form of ordering, such as a paper. In contrast, ANT will fully support the researcher's translations and see the text structure as ordering, as well as a representation of the researcher's perceived realities (Mol, 2002). We will unpack the chronological details of these structures. We will do this by scrutinising the emergence of northern lights tourism and how the structures accelerated and gradually presented themselves as a mature unity, to March 2020, when relationships and actors became visible, and their uncertainties and vulnerabilities became apparent.

Research in the last decade has increased our understandings of various aspects of northern lights tourism (see for instance, Jóhannesson & Lund, 2017; Mathisen, 2014), however, we still know little of the many elements that contributed to the success of northern lights tourism, which is the main aim of this paper. There is a dearth of knowledge on how historical and cultural antecedents and conditions, and subsequent contemporary marketing practices, along with northern lights tour performances, led to the growth of this tourism phenomenon. Our second aim is therefore to reveal some of the complexities and coincidences permeating tourism development—particularly in relation to attractions that may be emerging and growing, yet facing challenges associated with their remote and ephemeral nature (Heimtun & Lovelock, 2017). Our third aim is to understand the vulnerability of such tourism systems. The COVID-19 pandemic provided an opportunity to explore such aspects.

In pursuit of these aims, it is important to acknowledge that the northern lights are an instable and uncertain natural phenomenon, and that establishing a stable network of actors to manage the viewing of this attraction needs continuous maintenance. This is therefore also a story of managing the experience of a natural phenomenon after its introduction as a tourism attraction; a story, which can benefit tourism managers who work towards realising and developing an idea. Understanding network processes and the entities involved may also allow DMOs and tourism companies to better plan for interruptions and disturbances, such as the risks associated with future pandemics.

This paper is the result of revisiting voluminous empirical material, and as such, it is an expression of the multiple realities embedded in empirical data sets.

2. Northern lights tourism and COVID-19

The northern lights have fascinated northern people for centuries (Wærp, 2014). Only recently have these lights been added to tourist “bucket lists” (Thurnell-Read, 2017). From a niche tourist attraction for Japanese tourists in the late 20th century (Milner, Collins, Tachibana, & Hiser, 2000), these lights now attract a global market (Innovasjon Norge, 2019). Described as a “naturally occurring celestial phenomenon” and a nocturnal “charismatic megafauna” (Weaver, 2011, p. 39), this growing form of what has been labelled as “astronomical tourism” (Collison & Poe, 2013) has resulted in Arctic destinations becoming exciting playgrounds during the harsh northern winter (Mathisen, 2017a).

Tourist appraisals and marketing campaigns have transformed the northern lights into an icon of national identity (Mathisen, 2014; Sallstedt, 2018; Schilar & Keskitalo, 2018). Throughout a range of official tourism marketing material, there has been a struggle over who “owns” these lights. Norway's national DMO, Visit Norway, has sought to claim that Norway is the “home of the aurora” (Friedman, 2012b, p. 60).

Contrary to the situation in Iceland and Sweden (Sallstedt, 2018; Schilar & Keskitalo, 2018), the value of the northern lights in Norway has involved more than their cultural objectification and appropriation through tourism performances (Jóhannesson & Lund, 2017). Here, the northern lights have had a long history in the imagination of northern people, and they have played an important role in scientific expeditions and discoveries since the 1880s (Friedman, 2012a; Mathisen, 2014).

Despite sound scientific explanations, tourism marketing has revolved around the northern lights' mystery, otherworldliness and promises of spellbinding and strong emotions (Edensor, 2001). Based on historical and cultural references, Visit Norway has used the lights to construct an “Arctic fantasyland” marked by imaginaries of the exotic, primitive and magical (Mathisen, 2017a, 2017b, p. 68). These expressions of borealism (Mathisen, 2014) are also palpable in a documentary featuring Joanna Lumley's search for the northern lights, facilitated, supported, and capitalised on by Innovation Norway (White, Morgan, Pritchard, & Heimtun, 2019). Similarly, the municipality of Jukkasjärvi, Sweden, has used the lights to construct “a magical and dream-like place removed from other realities” (Keskitalo & Schilar, 2017, p. 413). Marketing efforts have resulted in a massive growth in the number of tourists and guided tours in Nordic northern lights destinations (Heimtun et al., 2014; Heimtun & Lovelock, 2017).

Research has focused on the guides' enactments and the co-produced nature of these tours, often marketed and staged as a chase or hunt (Bertella, 2013a; Heimtun & Viken, 2016). This work requires a flexible guide skilled in emotional labour, hosting, storytelling, conversation, and entertainment (Heimtun, 2016; Mathisen, 2012, 2019). The elusiveness of the northern lights, together with partially manipulated pictorial representations, have contributed to tourists' high expectations and subsequent challenges in delivery for the guides (Bertella, 2013a; Højrup, 2016). Guides have thus tuned into the rhythms of the lights, engaged with the tourists' media-induced expectations and levels of excitement, and facilitated potentially long waiting periods in dark and cold Arctic environments (Jóhannesson & Lund, 2017). Improvising has been important on nights with weak or no lights, when the guide has worked hard to maintain the tourists' spirits and interest (Mathisen, 2013). On nights with sightings, the guide plays a crucial role as facilitator (Bertella, 2013b; Jóhannesson & Lund, 2017).

Neoliberal growth-oriented strategies have made global tourism vulnerable during pandemics (Hall, 2011). No crisis before COVID-19 has managed to undermine the global tourism network this abruptly (Hall, Scott, & Gössling, 2020). In Norway, COVID-19 restrictions were coercive measures and regulations aimed at controlling the virus through discourses of *dugnad* and war (Gjerde, 2021). In the Norwegian welfare mentality, “*dugnad* is embedded in a moral repertoire of the socially responsible citizen” (Nilsen & Skarpenes, 2020). The government's appeal for *dugnadsånd* (collective efforts) enabled leaders to manage the COVID-19 situation by adopting and communicating a suppression and control strategy (Christensen & Læg Reid, 2020). In a country where governance legitimacy and social trust are high (Svendsen & Svendsen, 2015), the inhabitants trusted each other and complied with the government's crisis management (Christensen & Læg Reid, 2020; Helsing et al., 2020). The measures, however, did not fully consider the well-being of nature-based tourism actors (cf. Lück & Aquino, 2021).

3. Theoretical and methodological orientation

ANT emphasises how “tourism works, how it is assembled, enacted and ordered” (Jóhannesson, van der Duim, & Ren, 2012, p. 4). It focuses on unpacking the various realities of human and non-human actors through the notion of translation (Law, 1992; van der Duim, 2007). Translation is the process through which these actors put bits and pieces together—how they enable the ordering of structures such as product development and marketing. Such translation processes are the fundamentals of discourses, negotiations and agreements that establish

relationships between actors. Translation is part of the ordering of the network, a way of controlling and managing its objects and enabling them to organise collectively (Franklin, 2012). Translation and ordering are what a network constantly does to keep itself alive (van der Duim, 2007). Translation processes, however, have “no single master plan”, and there may be “many different modes of ordering relations that constitute the central object of the study” (Ren et al., 2012, p. 16)—here, the northern lights tourism network.

ANT abolishes the differentiation of humans and non-humans and deals with both on equal terms. This principle of general symmetry is important in preventing different entities from being defined by their properties and not their functions in the network (Haug, 2012; Latour, 1999a). This provides an opportunity to accept translations between humans, things, and natural phenomena. Translations have various traits as they work in multiple ways between various actors. Here, we understand translations as work that takes place between actors towards an understanding that supports the network. Translation is the work that goes on continually between actors.

ANT builds on a radical ontological understanding, acknowledging that the realities of actors may differ (Mol, 2002), even though they are enrolled in the same network. This is fundamental for the methodology of following the actor. As a network is a well-organised unity, the actors can differ substantially. The result of translations, ordering, is therefore important (van der Duim, 2007). Successful translations create ordering, materialised as plans, devices, organizations and much more. Ordering is useful for revealing the translations from which it stems. Herein lies the potential to learn how a natural phenomenon can work together with industry people, tourists, buses, cameras, advertising stickers, marketing schemes and other actors.

Multitudes of realities are always present in a network. One reality is its scientific explanations, another may be its aesthetic and visual appearances. Scientific studies of the northern lights, for instance, involve inscription devices (Latour & Woolgar, 1986). Such devices transform the materialities of the lights (wavelengths, electrons etc.) into graphs and curves, which enable scientists to make claims about them. In a scientific context, such celestial phenomena depend on such devices to constitute their existence. “The artificial reality, which participants describe in terms of an objective entity, has in fact been constructed by use of inscription devices” (Latour & Woolgar, 1986, p. 64). In a tourism context, the use of a camera works as a tool for tourists, guides and companies in their performances and advertising. Different actors with different agencies translate, order, and present a tourism product through such practices.

3.1. Methods at work

ANT is a methodological orientation without strict rules for methods (Jóhannesson, 2005; Law, 2004). Such research is often ethnographic, with a focus on case studies (Law, 2008). Data is diverse and could include “unorthodox informants” to describe how the “actor-network is constructed and held together” (Ren et al., 2012, p. 20). Inspired by Latour’s (1987, p. 176) tenet of “following the actors” and Law’s (2004, 2009) notions that various methods help enact different versions or realities, we involved a range of informants and methods in our study.

Table 1 shows the informants, and the data type and numbers. The main researcher interviewed 15 stakeholders and 11 guides (see Table 2), including two focus group interviews. She interviewed three stakeholders/guides twice. The focus in the group interviews was on shared experiences with northern lights tour guiding. She selected participants purposively, based on their involvement in northern lights tourism. The main researcher also interviewed 18 international tourists, recruited partly through snowball sampling and partly randomly (see Table 3). The three interview guides centred on the development of, and interviewees experiences with, winter and northern lights tourism. This researcher used open-ended questions, letting the conversation be free floating. The duration of most interviews was one hour. She recorded

Table 1
List of informants, type of data and number.

Informants	Data Type	Number
Tourism stakeholders	Focus group interviews	2
	Individual interviews	21
Tourists	Focus group interviews	8
	Individual interviews	3
Participation tours	Observation, fields notes, conversations	4
On- and off-line promotional materials	Finmark Reiseliv, Alta brochures (2004–2014) https://www.visitalta.no/no/ (2019–20)	10
	Visit Tromsø, Tromsø brochures (2004–2014) https://www.visitromso.no/ (2019–2020)	
	https://www.glodexplorer.no/ (2019–2020)	7
TripAdvisor OTR	Three companies (2014–2019)	1581
Documentary	Joanna Lumley in the land of the northern lights	
Project reports	Winter project	5
Other informants	News, statistics/market reports	

Table 2
List of tourism stakeholders.

Stakeholder participants (assigned codes)	Job title
Accommodation (A1)	Director
Accommodation (A2)	Leader sales and marketing
National DMO (DMO1)	Head consumer marketing
Regional DMO (DMO2)	Digital leader
Regional DMO (DMO3)	Manager - B2B
Regional DMO (DMO4)	Head
County DMO (DMO5)	Project manager
County DMO (DMO6)	Head
County DMO (DMO7)	Head
Local DMO (DMO8)	Leader project development
Local DMO (DMO9)	Head
Cruise (C1)	Head product development
Cruise (C2)	Marketing
Cruise (C3)	Guide
Incoming tour operator (TO1)	Head
State-owned enterprise (S1)	Senior consultant
Tour operator (G1)	Owner, guide
Tour operator (G2)	Owner, guide
Tour operator (G3)	Owner, guide
Tour operator (G4)	Owner, guide
Tour operator (G5)	Owner, guide
Tour operator (G6)	Owner, guide
Tour operator (G7)	Owner, guide
Tour operator (G8)	Guide
Tour operator (G9)	Guide
Tour operator (G10)	Guide
Tour operator (G11)	Guide

Table 3
List of tourists.

Tourist participants (assigned codes)	Nationalities
6 (T1–6)	Germany
4 (T7–10)	United Kingdom
2 (T11–12)	Switzerland
2 (T13–14)	Japan
2 (T15–16)	Brazil
1 (T17)	The Netherlands
1 (T18)	Australia

and transcribed all interviews verbatim and assigned codes to the interviewees (see Table 2 and Table 3).

The main researcher also collected 1581 TripAdvisor online travel reviews (OTRs) by tourists for three Tromsø-based companies

(2014–2019), which offered northern lights chases/hunts (by coach; by minibus/van; photo tour by minibus/van). To obtain first-hand experience, this researcher also participated in three tours in Tromsø and one in Alta. During fieldwork, she observed, had informal conversations with tourists and wrote field notes. The companies gave their informed consent.

When preparing for interviews with stakeholders, the main researcher read five project reports from Finnmark Reiseliv's (county DMO) Winter Project (2002–2010) (Finnmark Reiseliv, 2007; Jenssen, 2005; Juliussen, 2008, 2010; Karlström, 2009). The researcher also analysed on- and off-line promotional materials, mainly on DMO websites, read news on northern lights tourism to Tromsø and Alta, and closely watched the BBC documentary *Joanna Lumley in the Land of the Northern Lights*. Finally, this researcher read one *Forbes* article about a trip to Alta (Oseld, 2019) and studied relevant statistics and market reports (Enger, 2006; Innovasjon Norge, 2014a; Prebensen, 2014; Statistikknett Reiseliv, 2021). All these informants enabled the team of researchers to trace network practices and relationships, and to tap into the ways the northern lights tourism network connected with other networks.

The researchers were guided by questions such as how the northern lights tourism network emerged, accelerated, matured, and was disrupted, who the central actors were, and what the effects were of these workings (Ren et al., 2012). A modified version of grounded theory coding principles was used in analysing the interviews, on- and off-line promotional material and OTRs (Charmaz, 2006). The aim was not to construct a grounded theory, but to use the initial coding to find relevant data. After the open coding, axial coding was conducted, specifying the “properties of a category” (Charmaz, 2006, p. 60). Different ways to organise codes into categories were explored in the manually handled analysis. The rest of the data (reports, statistics, travel programmes and news) was not coded, but carefully read (Clarke, 2003). The researchers had frequent discussions about how to interpret the actor network.

Thick descriptions and in-depth insights were central, making it difficult to know when to stop following the actors (Beard, Scarles, & Tribe, 2016). We collected data between autumn 2013 and early winter 2021. The researchers then agreed to stop, rather than to wait for COVID-19 to end. We acknowledge that our account is only one way of explaining the northern lights tourism network (Jóhannesson et al., 2012), and that more data may have given new insights (Low, 2019).

3.2. Case study areas

Tromsø (population 76,649) and Alta (population 20,783) were the first northern lights destinations in Norway. Located under the geomagnetic pole/Auroral pole (between 60° N and 80° N), these Arctic destinations are in the zone of maximum frequency of northern lights outbursts. Here, northern lights can be visible in the evening and night from late September until early April. The polar night in these towns lasts about two months before and after New Year, when the sun does not rise above the horizon, although there are a few hours of polar twilight around noon.

4. Northern lights tourism network

We now explore the translations and ordering processes through which the northern lights tourism network emerged, accelerated, matured, and was disrupted.

4.1. Emergence

The process of ordering northern Norway into a winter destination started in the 2000s. In Finnmark, it happened by accident. The head of Finnmark Reiseliv (county DMO) heard about public money in the county administration being returned to the state. He lobbied hard to re-allocate this money to the development of winter tourism and succeeded

in this. Together with big tourism companies, Hurtigruten (coastal steamer), Rica (hotel chain with many hotels in Finnmark), Braahtens (airline) and Innovation Norway (national DMO), Finnmark Reiseliv's “Winter Project” was realised in 2002 (Jenssen, 2005). The project owners struggled about whether to invite tourism companies from all over the county or from only two destinations: Alta and Kirkenes. Choosing the former, based on Rica's wish for guests in their hotels in Finnmark, they later realised that this was a mistake and changed the strategy to include only the two destinations.

DMO6: If there is one public *kroner* [Norwegian currency] in Finnmark, you are entitled to it no matter where you are.

Interviewer: So, no one should be prioritised?

DMO6: No. We cannot choose. It slowed us down a bit.

The destinations in Finnmark were not ready for individual winter tourists; there was a lack of facilities and infrastructure to keep the tourists occupied, except during organised activities. The employees in Finnmark Reiseliv were young and eager but lacked competence and experience. They looked to Finnish Lapland for inspiration, without realising that copying mass-market development strategies would not be possible in Finnmark, which comprised mostly lifestyle tourism companies inexperienced with winter tourism. “We had many naive ideas, that it was possible to snap and copy that success” (DMO4).

The project owners disagreed about which markets to approach. The airline and Innovation Norway had capacities in Southern European countries, whereas Finnmark Reiseliv wanted to approach Germany and the UK. As Innovation Norway's offices there were not interested, they chose the former markets. In hindsight, considering the success of northern lights tourism in the UK, this was a mistake. In the southern European markets, there was some interest and turnover in the first years, but the companies did not make any money. The tour operators squeezed their price margins.

The northern lights were a part of the product development early on, as evident in the brochure *Finnmark. Norwegian Lapland 2004/2005* (Finnmark Reiseliv, 2004), but the lights were no more prominent than other promoted winter activities. Initially, Finnmark Reiseliv and the companies did not have adequate knowledge of the northern lights and how to market an uncertain attraction.

In order to understand the emergence of the network, the developments in Troms County, which started around 2003, are also of interest. The Swedish tour operator Tumlare had already realised the value of the northern lights in the 1990s, capitalising on the fascination of Japanese tourists. The development of tours and marketing in Japan resulted in 13,350 guest nights in 2002. Japan became the most important international winter market in Tromsø (Borch, Moilanen, Olsen, & Rydningen, 2006). Destination Tromsø/Visit Tromsø (local DMO) and most of the industry, however, did not consider winter activities as possible tourism attractions.

The Japanese tourists were sitting outside Scandic Hotel [Tromsø] waiting for the northern lights. I remember the Tromsø Wilderness Centre, which was one of the first to offer a tourism product, called Scandic, in 1999, and asked if they would send guests on a dog sled trip and got a raw grin for answer. Because nobody could imagine doing that. (DMO8)

This attempt to interest Scandic in sending guests on dog sled trips was dismissed by those with direct relations to the tourists. There was simply no understanding of how winter and the northern lights could be tourism attractions. Around 2003, however, with initiatives from a limited number of enthusiastic entrepreneurs, three of whom were passionate guides, northern lights tourism started to develop further. One of these pioneer guides ordered the elusive northern lights by branding tours as a “chase” and by labelling the guide as an “Aurora Chaser”. Destination Tromsø, however, resisted the idea of winter

activities, believing that tourists would dislike the cold and darkness. For this DMO, tourism revolved around developing the MICE market, in line with the wishes of hotel owners for year-round guest nights.

I saw the potential of the northern lights early on; it had to be possible to sell this here, even if everyone was just shaking their heads. ... It is despite the hotels that we have managed to build this northern lights industry. ... Late last winter [2013], a hotel manager suddenly discovered that the reception was full of people around six. He talked to them. They were going on a northern lights trip. He was very shocked. Then we had driven full cars for years. Tourism was not a good enough industry for them. ... Now they are milking winter tourists with higher prices. (G1)

There were, therefore, several paths into the network. Translation processes and orderings did not necessarily relate to the same agenda. The northern lights guide focused on the product, the tourists on the experience and hotel managers became involved to increase their revenue.

Other translations and ordering processes were central for the emergence of the northern lights tourism network. An incoming tour operator started to approach international cruise liners in Alta, in 2005, to generate winter traffic. In 2009, this initiative resulted in the arrival of one ship, marketed in the UK as “The Search for Nordic Light” (Alta Havn, 2009), and the coastal steamer Hurtigruten enrolled these lights into its networks in 2005, through the brand “Hunting the Light”.

4.2. Acceleration and maturing

The northern lights became a more prominent winter product around 2009. The development of camera technology, social media, and a documentary about Joanna Lumley’s search for the northern lights, first broadcast in 2008 (BBC, 2020) were triggering factors in the acceleration of winter tourism, transforming it into northern lights tourism.

Previously, photos and films of northern lights used to be murky and with a green tinge only. ... The strange thing with northern lights tourism, it has escalated at an insane speed. We had the northern lights in focus throughout the winter project, but it was not so prominent. We were anxious about creating expectations about something you cannot guarantee. Now we only talk about northern lights tourism. Before it was winter tourism. (DMO4)

A strong translation, central to the acceleration of the network, was the Lumley documentary: “There is a time before and after Joanna Lumley. She has been the big trigger for northern lights tourism” (G1). Its marketing effect has been noticeable in European markets, including Norway, after broadcasts and re-broadcasts. “It was broadcast around Christmas in the Netherlands; the effect was wow, tour operators talked about an immediate response” (DMO2), and “when it was broadcast in Norway last year, our phones started to ring. I don’t think Norwegians have understood the northern lights” (DMO8). The DMOs have over the years been involved in several TV productions; the Lumley documentary, however, stands out as the most important. “As long as she is perceived as a diva in England, has an Oprah Winfrey status, when Johanna Lumley tells you to go and see the northern lights, then you want to go” (DMO2).

The fact that Lumley saw the northern lights in the Tromsø region was not about the city, but because her selected guide was located there. The reason this guide later became famous as the guide who enabled Lumley’s euphoric and heartfelt experience emerged from the bad planning of the production and the guide’s initiatives. “I was supposed to be in the background, not part of the filming, just helping them find the right location ... Then I taught them how to film the northern lights, they had no clue. Then I said, you need transport, you can book me the entire week, and they did” (G1).

The BBC made this documentary in close dialogue with NordNorsk Reiseliv (regional DMO) and Innovation Norway. Due to several re-broadcasts in the UK and other countries, and its availability on YouTube and DVD, it played a significant role in the translation process for the accelerating network. However, NordNorsk Reiseliv and Innovation Norway knew they had to be proactive in promoting it themselves: “it helps that she is like a magnet, but we need to do the job, we cannot wait for people to find out where she has been” (DMO2). From 2009 to 2014, NordNorsk Reiseliv, Hurtigruten and Innovation Norway thus spent around NOK 42 million on marketing Norway as *the* northern lights destination, capitalising on the documentary (Innovasjon Norge, 2014b).

By expanding from its local origin to becoming international, the northern lights tourism network’s ordering effects resulted in a growth in international visitors and local companies. This resulted in a growth in hunting/chasing tours: in Tromsø from five in 2004–2005 to 88 in 2019–2020 (Destinasjon Tromsø, 2004; Visit Tromsø, 2020); and in Alta, a smaller destination, from three tours in 2004–2005 to 10 in 2019–2020. Eventually, not only the companies and DMOs, but also media and tourists started to use the terminology of hunt/chase more widely. In the 1581 OTRs, 530 tourists referred to chase/chasing/chaser and 92 to hunt/hunting/hunter in the title and/or the text. On the Visit Tromsø website for 2019–2020, tourists could choose from 67 tours labelled “chase”, of which 23 had “chase” and five “hunt” in the title. In Alta, four of 10 tours included hunt and one chase. Many of the tour providers also used this rhetoric in their sales pitch:

Join our Aurora hunt for an amazing experience under the northern lights. ... we’ll take you into the wilderness to hunt the lights with a small group of guests. ... During the Aurora Hunt you’ll be shown how to use your camera, photograph the Aurora and our guides will take photos of you.

(Wandering Owl, 2020)

In the winter of 2019–2020, many more destinations in northern Norway offered such tours, adding to the overall competition and maturity of the attraction. The rhetoric of hunt and chase made it easier for DMOs to promote northern lights tourism, as “it does not give you any guarantees” (DMO6). Moreover, the pioneer guide who ordered the elusive northern lights by branding tours as a “chase” and by labelling the guide an “Aurora Chaser”, gradually, also enacted the concept by “certifying” his tourist clients, who each received a woven Aurora Chaser badge, working as a marketing tool. “It’s funny to hear when people come here and say, ‘you know what, I saw someone on the subway in London wearing that kind of badge’. Two couples became friends because of it. It’s a little fun.” (G1) This material token thus strengthened the relationships of the tourists to the network and transformed the tourists into agents for the network outside the network.

The growth of international hotel guest nights also reflected the acceleration and maturity of the network: in Tromsø from 18,000 in 2008 to 200,000 in 2018 (November–April) (Menon Economics, 2019); and in Alta from 4542 in 2014 to 8226 in 2019 (October–April) (Nilssen, 2019). In Tromsø, Airbnb guest nights increased by 34% from 2017 to 2018 (Capia for NHO Reiseliv, 2019). Initially, partly due to the Lumley documentary, the northern lights attracted British tourists. In the winter of 2019, Great Britain, USA, Germany, Italy, and Asia were the biggest markets, but tourists came from many other countries, especially to the Tromsø region (Statistikknett Reiseliv, 2020). Consequently, and gradually, airlines started scheduled flights from hubs in Europe to Tromsø: in the winter of 2019–2020 from London, Helsinki, Frankfurt, Munich, Copenhagen, and Brussels. At that time, chartered flights from Amsterdam, Vienna and Zürich also arrived.

4.2.1. Tourist embracements

More and more tourists discovered the northern lights and came to

fulfil a dream, a longing, or a curiosity about experiencing this celestial phenomenon, many inspired by Lumley's dream and emotional reactions. These lights appeared to have triggered deep-seated longings for spiritual, awe-inspired, and emotional experiences.

Within about 20 min, the most wonderful display of the northern lights began. Whatever words I use can never do justice to what we then saw over the next seven and a half hours! It was the most awe-inspiring experience, a stunning phenomenon that is hard to explain the magnitude of. To see nature's own light show dance its way across the sky with such beautiful shades of green and purple blew us all away. ... it was like one of those kaleidoscopes you have as a kid, exploding all over the sky above your head!! You just didn't know where to look. It was happening across such a wide area. It truly was an experience that none of us would ever forget ... (TA505)

Many tourists ordered the northern lights through their cameras. This was evident in TripAdvisor comments on equipment, training, and the posting of photos, which posters described as "great", "pretty", "breath taking", "incredible", "fantastic", "better than the dream" and "once in a lifetime". The tourists' ordering practices, through the camera, were also a form of trophy hunting. Some tourists used these pictures, when shared on social media, to create envy and recognition from family and friends; it was part of their construction of self. One TripAdvisor reviewer wrote that their pictures "got so many likes on our FB page. :) We made loads of our friends back at home jealous! Haha 😊" (TA121). Tourists also shared their photos with curious friends. A few made scrapbooks. The tourists thus translated northern lights into their networks through proofs, trophies, souvenirs, and mementos, which then worked as intermediaries in the communication between these networks.

Some tourists, however, did not want to order the lights or let their devices order their experiences. They just wanted to stand and watch the lights dance across the sky. One interviewee remarked that she did not need a photo as proof; more important was having the experience "here [head] and here [heart] ... as they don't show the cold, how you feel ... it is just flat" (T18). Moreover, as one of the guides pointed out, when you were so immersed in taking pictures "you might miss something ... it looks green all the time. You might miss the red coming in" (G8). When the lights were only visible for a few seconds, too much focus on the camera could mean that you missed it completely. Some of the guides therefore encouraged the tourists to relax and enjoy the lights with their eyes only. One guide often asked the tourists "do you want to see the northern lights or take pictures of them?" He often found that they disregarded his advice, as they were "so focused on getting a picture" (G9). Such devices could thus work well in the strategic ordering of northern lights imaginations, but not always in practice, as they could cause a disturbance to the experience.

4.2.2. Local constraints

The maturity of the network enabled actors, not conforming to its strategies, to put pressure on it. Tromsø experienced a rise in the number of guides and operators arriving from outside the region. Locally termed "cowboys", they lowered the standard and reputation of northern lights tours (Garfeld & Pedersen, 2017). In 2019–2020, "Eastern European guides came in December and stayed till January, and then they ran off" (G7). Exploiting the resources of the established network, these new actors challenged the quality of the existing products and increased the competition. The guides in Tromsø were already constrained by the limited number of places for northern lights sightings. The established guides selected locations based on earlier experiences and their lay knowledge. The newcomers in some sense hijacked locations established through the work of the network. The work of selecting a location meant finding a place with clear sky and little light pollution. The guides engaged several entities with ordering effects to do this: meteorological

information, the climate zone of the area, lay knowledge on local weather variations, northern lights apps and the KP-index (indication of geomagnetic activity (1–9); high numbers equal higher chance of northern lights manifesting) (Aurora Service, 2021).

In selecting the chase/hunt locations, the guides enrolled into other networks with other modes of ordering: road infrastructure, other drivers, and the traffic of competitors. On nights with heavy traffic, this resulted in conflict. Transport drivers also used the limited number of stopping places for mandatory rest periods. One incident resulted in a headline in the newspaper *Nordlys*: "Northern lights tourists created fear: Lighted a bonfire nearby a truck" (Pedersen, 2019). On some nights in 2019, there were also examples of overcrowding: "on Ringvassøya, northern lights cars were parked along the road from where the street lighting stopped until the end of the road" (G7).

Despite some challenges, all translations and modes of ordering combined led to the maturity of the network. At first, the northern lights were just one entity translated into a winter tourism product from mid-December to mid-April. Unlike other winter activities, the northern lights tourism network only relied on darkness; thus, gradually, tourists came from mid-September until mid-April, resulting in a "fifth season", the northern lights season.

4.3. Disruption

In March 2020, COVID-19 and the subsequent travel restrictions interrupted the northern lights tourism network.

The five are the only tourists out here this evening. A year ago, there would have been many hundreds of tourists here. Then the tourist buses were parked along the roads and the locals despaired about tourists making their way to the shore. ... Until March 12 this year, the family company Arctic Breeze ran two full buses with 17 tourists in each, every night. This winter, nine out of ten tourists are gone. (Ytreberg, 2020, p. 7)

The absence of tourists from the network was estimated to be a NOK 2.7 billion loss in value creation and 3335 lost jobs in Tromsø in 2020 (Engebretsen & Jakobsen, 2020). The first national lockdown led to a one-and-a-half-month shorter season for the northern lights tourism network, in effect reducing the amount of work the network was able to do. It became obvious that the work done in the network in ordinary times did not apply during the COVID-19 pandemic. Most of the actors involved, tourists included, no longer worked towards its aims. As a result, there was a lack of income, layoffs, and international guides left. The remaining actors needed to focus on other translations and try to reorder the network, adapting to the new situation. From then on, DMOs continued to market the northern lights, now together with the slogan "Dream now. Visit later". Turning the marketing message into dreaming was a way of keeping the network and the attraction alive, while the businesses struggled to survive.

Although the government accepted domestic and international travel from 15 May until 20 August 2020 (Folkehelseinstituttet, 2021), this temporary reopening did not affect the northern lights tourism network, since this was the time of the midnight sun. As two participants noted, "Many do not have much activity during the summer" (DMO3) as they can afford to "operate at a minimum" (G7) and they needed a break after a long and hectic season. Companies were preparing for the arrival of the first northern lights tourists in September: "I got many bookings during the summer, when it was open, however, they have all been cancelled. I had to return the payments" (G4).

The northern lights tourism network was thus still alive due to continuous interest and hope in the marketplace during this summer, but the new restrictions driven by the pandemic, was a great barrier. Northern lights tourism markets were international; from the usual start of the northern lights tourism season in September 2020, tourists travelling from most countries in Europe had to stay in quarantine for 10

days after arrival (Folkehelseinstituttet, 2020). Even though it was possible to travel to Norway, few tourists came. This meant that COVID-19 and the government's restrictions now had a much more prominent place in the network. It was not possible to negotiate with the pandemic.

In the second lockdown, from September 2020 to 7 January 2021 (Regjeringen, 2021a), fourth quarter of the companies tried to be active, however, the booking situation was bleak, and the first company went bankrupt in November 2020 (Mehren, 2020). One company had one booking in September, four in October, 12 in November and none in December. The few tourists who did complete a booking were domestic. Moreover, the government-imposed social distance requirements of one meter restricted the companies: "You can have two tourists in a 9-seater and six in a 16-seater" (G7). It was difficult for trips to be profitable. One guide recounted, "It is economically hard" and mentally constraining: "the last week all I have done is lie on the couch eating and watching TV. It has been very tough ... without much money you get a little shattered ... but I am not giving up" (G4). Without tourists, the northern lights tourism network was deteriorating, as illustrated by this guide's disheartened expression. Although the pandemic was threatening people's life work, they were still "positive towards the authorities' advice [regarding COVID-19 restrictions], like everyone else; we just want this to end" (DMO3).

From 29 January 2021, the government's stricter entry rules, due to the infectious Alpha, Beta, Delta, and Gamma COVID-19 mutations, made it impossible for international tourists to travel to Norway (Regjeringen, 2021b). The pandemic and the measures to avoid outbreaks from international tourists interrupted the entire northern lights tourism season in 2020–2021. The companies were now refocusing on surviving the pandemic. The work to maintain the network became of less importance. The aim of attracting tourists became meaningless.

4.3.1. Mitigation

In order to mitigate the financial consequences of the necessary travel restrictions, the loss of built-up knowledge, competence and skills, the Norwegian government influenced the northern lights tourism network through economic support systems. They initiated several business compensation schemes, funded by the Government Pension Fund Global (AKA Norwegian oil fond) (Regjeringen, 2020a). The government dipped into the fund to prevent strong economic fluctuations for local communities and industries. As an example, in October 2020, the government allocated NOK 2.8 billion to support the tourist industry until February 2021 (Regjeringen, 2020b). The government also twice changed the regulations for temporary redundancy/unemployment benefit (from 26 to 52 months to 1 June 2021) from the Norwegian Labour and Welfare Administration (NAV) (Regjeringen, 2021c). However, the seasonality of northern lights tourism meant that in the initial phase of the pandemic these schemes only partly helped the financial situations of companies. As the governmental schemes were not enrolled in the network through processes of translations, the smaller, seasonal tourism companies were not in a position to negotiate their effects and outcomes.

The first two months I got money from the business compensation scheme, then nothing [second scheme]. I have gotten money from NAV every month thereafter. I have survived thanks to that. ... I hope to get more support from the third business compensation scheme. I will apply in January. (G4)

The companies were no longer focusing on their tourism products, but on documenting financial losses to fulfil the government's requirements for support.

4.3.2. Challenges and hope

The tourism companies were encouraged by the government to adapt to the domestic market, however, the on-and-off travel restrictions meant that this market segment was unreliable. Another challenge was

that most companies had furloughed their staff.

Many companies want to adapt, to offer products to Norwegian markets. However, this is hard to do if you had to lay off your staff. ... How can you push forward when the staff cannot work? ... When you work elsewhere ... the will is there, but it is not easy. ... The companies need to learn how to communicate with other target groups. Some have not had any targeted activities at all; the influx of tourists has been so large. They have not needed to.

(DMO3)

The effect of COVID-19 on the northern lights tourism network was thus interruptive, with the potential for dismantling it entirely. Despite all the challenges, stakeholders believed that it would bounce back: "We hope that the 2021/22 winter season will be quite normal" (Myreng, 2021).

Fortunately, the northern lights do not disappear. They are the main reason to go which will remain also after the coronavirus. (DMO3) I am very positive towards the next season ... I think we will see results in the autumn. I must at least think that and dream about that. (G4)

Such hopes during the pandemic continued to demonstrate how the transformation of the northern lights as a natural phenomenon has been a success. From being without relevance, as a tourism attraction, to becoming enrolled in the network, they remain a focal point for the future of the network.

5. Conclusion

In this paper, we have described how the translation and ordering processes of the northern lights established the northern lights tourism network. We have unpacked its emergence, acceleration and maturation, and its disruption, thereby demonstrating the complexities of the network. Our use of ANT enabled us to investigate the practical processes of translating and ordering the northern lights into a robust tourism network (cf. Jóhannesson, 2005). We have illustrated how elusive natural phenomena in peripheral locations can become successful tourism attractions, and we have depicted their vulnerabilities when facing hostile actors (cf. Gössling, Scott, & Hall, 2020).

There has been a substantial amount of work behind the emergence of the network in the two destinations. It has been a work of translations and orderings, and the practices, and enactments of one actor (the northern lights) which is unreliable and elusive, but still demanding when it comes to places where it can set to work as a tourism attraction (Heimtun & Lovelock, 2017). The findings add to the knowledge of how the work done in Tromsø and Alta led to two different paths (Heimtun & Viken, 2016). In Alta, we demonstrated that the winter project was a way of ordering tourism through public funding from an already established network structuring the translations. In Tromsø, no such structures existed, leaving them freer to develop the network. In Alta, actors were first enrolled into the winter project, and later this was extended to the northern lights network.

The imaginations, yearnings, and bucket lists of tourists, as well as the growth in hunting/chasing tours, enabled the acceleration of the network. Growing from a few actors in small tour companies, the network became a structure that more and more took form as a unity—the term "northern lights tourism" was synonymous with everything going on in the network and related to it. Although the network was recognised locally and nationally, the maturity of the network also led to overcrowding, a lack of quality control and spatial conflicts with other networks. Despite some discontent, in the winter of 2019–2020, this network presented itself as stable. It secured employment, enabled competence building, was part of national, regional, and local marketing campaigns and local pride, and it raised national awareness (Mathisen,

2014). Market reports and statistics that demonstrated the ongoing success and iconification of Norway's northern lights supported the maturity of the network (Mathisen, 2014; Sallstedt, 2018). The messiness of negotiations, translations and orderings then disappeared into the black box of the northern lights tourism network (cf. Law, 2002).

Our illustrations of the actors' motivations, perspectives and understandings add to existing knowledge on northern lights tourism (Bertella, 2013a, 2013b; Heimtun, 2016; Jóhannesson & Lund, 2017). The analysis of the ongoing translations and orderings of the network, as materialised in the practices of the tourists and the lights, has given new insights into the role of the camera device in and between the northern lights tourism network and other networks. Moreover, our analysis of the Lumley documentary has added to our understanding of travel journalism (White et al., 2019). Enrolling a celebrity in the network is crucial for marketing success, although not enough. We have shown that following up with co-funded strategic marketing resources and the unintended and spontaneous enactment of Lumley's guide, the Aurora Chaser, contributed to the realisation of the documentary.

COVID-19 interrupted the ordinary work of the network and forced the actors to refocus on how to survive as businesses in a situation where tourism was disrupted. This led to the depunctualisation of the network (van der Duim, 2005). The Norwegian government and health authorities entered the network, thereby abruptly interrupting its ordering and introducing new translations. The northern lights tourism actors, on the one hand, accepted and trusted the government's infection measures, mobility restrictions and the rhetoric of *dugnad* (cf. Christensen & Lægred, 2020; Gjerde, 2021; Nilsen & Skarpenes, 2020). On the other hand, a sense of despair for the current economic situation affected their mental well-being (cf. Lück & Aquino, 2021). Despite this, their social trust and the prospects of COVID-19 vaccination also gave them hope for and belief in the resilience of the network (cf. Hall et al., 2020).

This paper has illustrated the messiness of addressing micro- and macro-level processes and how they are linked (Latour, 1999b), when investigating the complexities of developing and maintaining tourism attractions. For tourism managers, this study can increase an understanding of how one natural phenomenon can be translated and ordered into becoming a tourism attraction through complex processes of negotiations in the different phases of the development. To succeed, initial actors need to centre upon one idea and work towards developing it, thus enrolling more actors interested in realising its potential. Destination dynamics come into play in this process. Other natural phenomena have the same potential to become tourism attractions if actors are willing to work with them. Our research also demonstrates the value of ANT, not only for historical analyses of the development of tourism systems but also for future-oriented purposes. Future pandemics represent threats that the tourism industry needs to pay attention to. Not being able to prevent such occurrences, the industry needs to work with governments to secure financial safety nets that can be implemented immediately, when such threats occur. With such structures in place, tourism networks will not need to completely refocus on survival.

This paper has offered some interesting empirical insights based on the multitude of actors involved in the northern lights tourism network. Further research in the same case study area could follow up on the re-emergence of this network post-COVID-19. This knowledge would contribute to understanding the stability of the network; how the actors then do their translations. Other studies could examine one actor, thereby having the opportunity to do more detailed and a deeper analysis of how this actor is enrolled in and contributes to maintaining the network through its emergence, acceleration, maturing and potential disruption. Such knowledge could cast new light on managing tourism, and be of importance for other social science areas.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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