Preface

This is a speculative book grounded in ethnographic research. It focuses on the university institution of the global North and West in the Anthropocene – a time when computing, servers, and data centres consume increasing amounts of energy on a planet that already operates beyond its ecological boundaries. Our concern is not about data centres of big tech, of intelligence services or of industry complexes. These can be readily criticised for generating excessive profits and consuming vast amounts of energy, particularly when others face energy scarcity and the planet continues to heat up. It is less easy to critique scientific data centres, since most agree that we need scientific research, for example, to deal appropriately with the climate crisis. But scientific data infrastructures also consume a lot of energy, and also their servers are full of metals extracted from the planet and most often fabricated under extremely damaging conditions. Attending to scientific data infrastructures in relation to the planetary condition presents us with a genuine dilemma, with real trouble. It cannot easily be resolved by deciding between keeping data centres or keeping science. So, we will instead stay with the trouble for a while.[1]

We focus on public data infrastructures, particularly in a European context and more specifically in Germany, where universities are funded by public money and thus accountable to society at large. The substantial energy and water consumption of data centres is well established. As university data centres are public institutions, citizens in principle have a say in how universities work: How do we want scientific data centres to work in relation to the planet? Discussing data infrastructures in relation to universities invites a nuanced debate about how to deal with increasing amounts of data processing and with expansive data infrastructures on a damaged planet.[2]

As members of the Collaborative Research Centre "Virtual Lifeworlds" in Bochum, Germany, we have been conducting ethnographic research around university data infrastructures and scientific data practices since 2022. Our research discusses the connections between the planet and scientific computing, including how their infrastructures are linked to extended relations of ecological conditions and global value chains, and shaped and informed by the work, lives, bodies, and landscapes that sustain them. We are tremendously grateful to all scientists, data infrastructure operators, energy managers and the many others who have agreed to engage with us and shared their work and practices.

Our ethnographic observations are not represented as naturalist reconstructions of what we have experienced. Instead, we present them in a speculative style that draws on science fiction. Science fiction is often used as a catalyst for the development of novel thought, and as a repository for new ideas. Yet, science fiction also works as a critical medium through which potential sociotechnical futures are explored and contested. It offers a space to reflect on the implications of new technologies and to negotiate their consequences for socio-technical coexistence. Science fiction facilitates discussions about changing normative social orders because it suggests new patterns of thought that are nonetheless rooted in history and tradition. The genre has close relations with pop culture. It points to the fact that the relationship between humans and machines has never been an exclusively scientific debate, but indeed a topic of popular interest. In this book, we take up reflections on digital data and data infrastructures – particularly data centres – and their interrelations with university life and with the planet. We hope it will inspire both scientific and popular exchange.

The little speculative stories of this book are framed by a narrative about a university that lifts off the ground with all its buildings, data centres, and staff, and comes to hover above the Earth. The metaphor of *landing* and of learning to land is borrowed from an edited volume and exhibition catalogue[3] in which the editors differentiate between the modern logic of human progress and growth on the one hand and what they call a climate regime on the other. In a climate regime, life and practices are entangled with and grounded in planetary realities. In the logic of progress and growth, on the other hand, people are neglecting the planet and metaphorically speaking their world is 'hanging in thin air'. Our stories find science hovering above the ground it studies. It no longer notices the friction[4] of the worlds it draws from. It struggles to see how its abstractions pull away from the lives that anchor their relevance. And this is not only the case for science, but for the whole information-based university. They need to learn to land. They are not very different from us, and we invite readers to think with them and with us about a move from staying with the human, with progress and growth, to staying with the planet; from acting as if hovering above planetary reality to landing and living with planetary consequences.

Planetary thinking and doing is certainly about ecological relations, yet following a number of contemporary and often decolonial thinkers,[5] our understanding of the planetary and of planetary knowledge is more fundamentally about engagement with extended and other forms of relations and coexistences. These involve not only human beings, but also

non-human creatures with which humans share the planet. The capacity to act, as well as its limitations, arise from connections and interactions with a multitude of often invisible relations. Acting in a university of a damaged planet is a constant recalibration with and through materials, utilities, social dynamics, political regulations, categories and standards, energy flows, microbes, land masses, your office neighbour a floor below, air masses, aquifers, waste heaps, chemical interactions, click workers 9,000 km east preparing your next AI prompt, kin, and so forth. We must face these relations, as scholars and as institutions. In embracing the planet, crucially, we assume that we do not have to retreat, that we are not necessarily in a dangerous position, and that we definitely should not give in to fatalism[6]. As is characteristic to the position of staying with the planet and with contemporary climate troubles, the stories in this book are not about everyone, everywhere, but about particular, situated practices at a specific university. The stories carry specific characteristics of German academia. This also means that they have limits and are different from many other stories told and stories that could be told. They paint a picture of a world that has extraordinary computing power, the energy resources, and a social and political system that allows universities to run advanced computing infrastructures. Their experiences, problems and challenges are grounded in and limited to this world. There are many universities in the world that do not face these challenges, because they do not operate under the same power or financial conditions. We acknowledge that they have problems and challenges that are existential in very different ways. People from these places will not find themselves represented by the stories in the book. This is one of its key limitations.

Presenting our ethnographic insights as a science fiction and a speculative fabulation, means that the specific university in focus is not a real university. It is certainly based on systematic ethnographic studies at very real universities, but we refrain from calling our observations purely factual. Instead of trying to represent the research material in a naturalistic, distanced fashion, we have enriched and concentrated the observations and conversations to make the key characteristics stand out – sometimes exaggerated and caricatured. Our focus is on the practices, cultures or challenges of universities' engagements with scientific data, data infrastructures and the planetary condition. While based on very specific, situated observations, the stories are results of our analyses across different situations at a number of universities. Few of the utterances or practices in the stories happened or were uttered exactly as they appear here. They are our interpretation.

The book's images were produced during the workshop "Sustainable Data Paths: Digital Infrastructures in Science" from 05–07 November 2024 at the Ruhr-University Bochum, where scholars from diverse disciplines, academic staff, data infrastructure operators, university IT user representatives, research data management experts, purchasers and third-party funding institutions came together to discuss the entanglements between knowledge production, infrastructure, and planetary reality. The participants joining from different universities were encouraged to reflect on the entanglements of data infrastructures and the planetary condition on the basis of a colourful map displaying observations, prominent quotes, documents and images, all of which were excerpts from our ethnographic research. Very warm thanks go to all participants of the workshop for their willingness to engage in our experiment and for their sincere input. Two graphic recording artists, Johanna Benz and Tiziana Beck from graphic-recording.cool, made line drawings to record the exchanges during the workshop. A selection of these drawings accompanies the book's stories, and supports its story-telling character. While the images are key to each story, text and image relate to each other in different ways. Sometimes, they comment on each other; sometimes, they illustrate each other; sometimes they offer contrasts or different perspectives. The tensions between text and image underline the book's invitation to readers to reflect on the question of how scientific knowledge production through data practices relates to our planetary situation, and on how universities engage with this reality.

Here is how we envision the book might be read: imagining, wandering, occasionally getting lost, starting again, maybe recognising, and definitely thinking. The speculative framing of a university that takes off and leaves the ground is the beginning of the university's urgent task to learn how to land, that is, to learn to engage with the conditions and dynamics of the Anthropocene and to remain able to respond to the planet. 'Staying with the Planet' invites readers to pause at titles, images, specific sentences, or cross-references, allowing them to trace their own path of reading and thinking through the book, likely marked by detours, interruptions, and leaps back and forth.

The stories are presented in three chapters. The first chapter inquires into university realities whose institutional and scientific practices tend to unfold as if the stressed planet did not matter. The second presents examples of practices that seek to engage with the critical condition, but for many different reasons tend to fail. Put differently, the first two chapters are meant to show how complicated it is to change the contemporary

situation, and how so many different institutional practices, regulations, habits and norms, material arrangements and organisational orders are involved in keeping the harmful status quo around data practices and data infrastructures and ignoring planetary reality. Yet, we end the book with hope. With different kinds of stories. The third chapter introduces practices we have observed or encountered through literature and conversations with colleagues and friends. While these stories are in no way instructions of how to act, we hope they inspire ways to engage with scientific data practices and university infrastructures that, at least in part, respond to the challenges of the planet and remain grounded in its conditions. That is, to learn how to offer occasions for learning to land. The speculative fabulations and the images are presented as a variety of different materials, such as manuals, flyers, data base and diary entries, as well as conversations and observations. They present different scientific, technical and administrative characters, who in diverse ways are involved in data practices and data infrastructures, sometimes entirely ignoring planetary reality, sometimes taking it into account, often just trying. The stories do not add up to a coherent whole; rather, each is a window into specific practices or patterns, challenges or alternatives the three chapters aim to convey.

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The book is an exercise in picking up, letting things tangle, and digging in our carrier bag of research. In the words of Ursula Le Guin:[7]

"Science fiction properly conceived, like all serious fiction, however funny, is a way of trying to describe what is in fact going on, what people actually do and feel, how people relate to everything else in this vast sack, this belly of the universe, this womb of things to be and tomb of things that were, this unending story."

1. A key inspiration to the title of this book is Donna J. Haraway's (2016) book *Staying with the Trouble*. To stay with the trouble means exactly that: to be with it, experience it and get a feeling for its dynamics, why it is there, and why it doesn't go away, who is involved, who benefits and who suffers from it, etc. This is different from fixing a problem. Then you try to isolate the problem and make it go away, and you easily overlook that it is entangled with many other processes and actors, and they may stay, or even get worse, when you fix the problem as if it were isolated; when you do not respond to the complexity of interactions and dynamics that make the problem exist and that it helps sustain. In this book, we try to stay with the planet as a trouble, when attending to university data infrastructures. We dig into the world of university data infrastructures and try to understand how the planet is a trouble here, and what troubles it makes.

2. The term *damaged planet* stems from Anna Lowenhaupt Tsing et al. (2017), who published a collected volume to discuss how you can live, what you can do, when you reside on a planet that is already injured and hurt. They urge us to attend to the damages and the conditions a damaged planet leaves for us to live in. This is different from what we may call a *whole-world* thinking, where the foundation for thinking and acting is the idea is that we live on a healthy and unspoiled planet, and that when there are breaks and cracks, they will soon be fixed. It suggests we can turn our back to damages, while expecting someone else to clean up and develop technologies that will allow for new practices beyond the broken ones. Data infrastructures are a good example for exercising how to live on a damaged planet: On the one hand we surely need them but on the other hand, they are part of the problem, they also contribute to damaging the planet. A real dilemma.
3. Bruno Latour and Peter Weibel (2020).
4. Anna Lowenhaupt Tsing (2011) introduces the term *friction* to anthropology and points to how for instance a wheel needs friction in order to be able to move a bicycle ahead. Similarly, societies and social relations cannot subsist without friction.
5. Among these are Gayatri Chakravorty Spivak (1999), Déborah Danowski and Eduardo Viveiros de Castro (2017), and Isabelle Stengers (2015).
6. Steven J. Jackson (2023) coined the notion of *ordinary hope* pointing to hope deepening rather than reducing our planetary entanglements.
7. Ursula K. Le Guin (1986, 170)