Pursuing the Quantum Imaginary: Esoteric Knowledge Production and the Future of Telecommunications
Nadia Amstrong (NCAD)

Through an artist-ethnographic lens, Armstrong's practice-based PhD research examines the systems of knowledge that underpin quantum communication technologies. In this presentation, Armstrong will break down the practice-based research methodologies she harnesses to study how the field of quantum communications is understood through broader histories of science, technology, belief systems and culture - tracing the entanglements of bodies, machines, and knowledge systems to create what she calls the Quantum Imaginary. Through this research and practice framework, Armstrong parafictions a techno-feminist horizon, using digital processes to conjure imagined phenomena that might help us resist technocracy and emerging forms of techno-feudalism. Drawing on quantum phenomena, Armstrong interprets and envisages quantum research's established principles as modes with which to interrogate the constraints of science-based knowledge production. She is interested in how interpreting quantum principles as philosophical frameworks for "knowing" can enable researchers to produce and reinstate other forms of knowledge that typically exist outside the technoscientific paradigm; forms of knowledge that rely on instinct, intuition, belief and imagination.

Is There Anything Outside Measurement? Memory Assemblages and the Indexicality of What Is There to Be Found
Shajara Néehilan Bensusan (The University of Brasília)

Karen Barad ascribes to Niels Bohr a general lesson drawn from quantum physics: we are part of the universe we endeavor to understand. To an important extent at least, this can be rephrased as an an assertion concerning the way measurement and the measured are entangled. That is to say that much depends on the entanglement around measurement. Less than being relative to the observer, things can prove to be relative to observation. If this is so, what is real begins to appear as itself situated – which moves us away both from the idea that it is subjective or conventional while keeping us away from the notion that it can be seen from anywhere. In this talk I'll explore the idea that measurement is ubiquitous and we interfere in the universe through it. Further, I'll show how this idea can be extended to encompass issues in modality and time – and how it can be connected to the pan-mnemism I have been recommending. Alfred Whitehead famously thought of measurement as a starting point of his theory of (situated) events. He claims that while Henri Poincaré is right in stating that measurement is relative and conventional, Bertrand Russell is also right in holding that there is no (useful) circunstance in which an ordinary billiard ball can be larger than the sun. Whitehead claims that measurement is situated, it depends on the standing location from which the measurement is done. Whatever measures is also to some extent also measured. We measure from where we are – there is no measurement from nowhere. Now, Barad, on the footsteps of Bohr, wants to extend the lesson from quantum physics broadly. For her that means, among other things, to extend the notion of measurement – and its associated entanglement – beyond domains where it is normally considered. She argues that agency can be understood in terms of an entanglement of measurements. Taking this path, I would suggest further that logic diversity can be understood in terms of a diversity of systems of measurement for entailment, strength of arguments and, crucially, *a priori* validity – of what Whitehead would call nexuses. A logic can be understood as a class of possible worlds – by considering this class we can determine what is possible, co-possible, contingent and necessary within a logic. A logic is a measurement of modality. I'll then consider measurements of time. According to the view I offered

in *Memory Assemblages*, time is an effect of the articulations of memory while the diacronic pair that entangles what is retained and what is retrived is ubiquitous. That means that there are archives everywhere – they are what we find but also where anything else in the world is located – and they are orphans in the sense that they are hostage to the additions to come to place them in a different context. Orphanhood is the way Plato characterizes the text in *Phaedrus*. Archives on their own have no effects unless they are measured, this is where retrieval happens through addends in the form of events, thoughts or circunstances. As a consequence, investigation itself is part of what makes sense of what is investigated, or measured; there could be no content that is retreival independent as addition is taken to be intermittently coming. The dependence on retrieval makes sure the real is situated – and its past is always deictic – but disolves previous bifurcations concerning the objective and the subjective or intuitions and concepts. The quantum archive is thus hostage to the different retrieval exercises that could reveal different things in them. They cannot subsist without measurement – and they cannot be one way or another without a (retrieving) measurement.

Building Bridges between Quantum and Chaotic Systems
John Campbell (NUIM)

Quantum entanglement is demonstrated in optics and superconducting circuits as a non-classical links between particles that remain strong and secure no matter how far apart the particles may be. Meanwhile, another non-classical phenomenon abounds in our universe—chaos. It also invokes a kind of spooky action at a distance, not only in space but in time. Non-local behaviours seen in entanglement and chaos can act on complex systems. These systems are all around us, from the signalling of animals to the synchronization of pendulums, even how particles interact in the phases of matter. The presentations seeks to showcase some of the simulations I have conducted with software and hardware, which does not necessarily take us into using the exotic systems found in a quantum optics lab. From this we could very well ask: are all of these variations on a common physical theme? Another question we could ask in this research is: at what scale does entanglement end and synchronization begin and vice versa?

From Simulation to Creation: Quantum Generative Models as Deleuzian Machines of Difference and Novelty
Stephanie Dossou

Quantum generative models extend the creative potential of machine learning into the quantum domain, where superposition, entanglement, and interference enable the exploration of probability spaces inaccessible to classical systems. Approaches such as Quantum Generative Adversarial Networks (QGANs), Quantum Boltzmann Machines (QBMs), and quantum autoencoders illustrate this frontier: QGANs train quantum states to mimic data distributions, QBMs exploit non-classical energy landscapes for sampling, and autoencoders compress information while preserving quantum correlations. These architectures not only promise efficiency gains but also open the possibility of generating forms of novelty irreducible to classical computation. This paper situates quantum generative modelling within Deleuze's philosophy of *difference* and *repetition*. Unlike classical generative models, which often refine statistical regularities, quantum models actualise novelty through indeterminacy, where repetition across quantum states yields emergent structures. The presentation will (i) outline the main techniques in quantum generative modelling, (ii) consider their applications in discovery and optimisation, and (iii) explore how they exemplify machines that are at once technical and conceptual. By connecting advances in quantum AI with Deleuze's account of difference, the paper highlights how these models invite us to rethink creativity, emergence, and the production of the new in both scientific and philosophical registers.

Three Quantum Ecologies: Speculative Sociotechnical Systems—The Quantum Stack—Chaosmotechnics
Radek Przedpełski (TCD)

Already in 1982 Richard Feynman presciently speculated about the possibility of a quantum computer capable of "imitate[ing] any quantum system, including the physical world;" this would not be "a Turing machine, but a machine of a different kind." Feynman's insistence on the simulation of nature, seen as a probabilistic, quantum mechanical phenomenon, resurfaces today in the notion of "quantum ecology" and "quantum ecosystem" applied with respect to quantum technologies and their applications. The presentation seeks to interrogate the notion of "quantum ecology" in policy documents and social theory in order to identify its underlying epistemes and point towards their lacunae, as well as recover, in a decolonial media-archaeological gesture, Stanisław Lem's (1921-2006) seminal work *Solaris* (1961) as an artistic modelling of quantum communication open to radical contingency and noise. In this way, the presentation identifies abroad spectrum of approaches to quantum technologies ranging from speculative (artistic and philosophical) and social-theoretical ones, foregrounding the potentiality inherent in quantum operations, to those "practical" and technical, reducing quantum technologies to a purely logistical or engineering problem, the "quantum computing stack." Even if all these have in common an expended understanding quantum technologies placing them in their associated techno-geographic milieu, they differ in the degree to which they factor in the social field and in their assessment of the role of noise. On the latter, I am going to demonstrate how Lem's *Solaris*, provides a topical commentary on the current problem of quantum noise and the resulting decoherence. A polemic with the Shannon-Weaver model of communication and Wienerian cybernetics, the novel can be seen as veering towards Gilbert Simondon's transductive take on communication but expanded towards recognition of the productive role of noise preventing operation and measurement—seen today as an obstacle hindering the power of quantum computers. As will be argued, Lem's novel prefigures Gilles Deleuze's *Difference and Repetition* (1968), which counters mechanistic repetition with an expanded understanding of Simondon's communication theory embracing chaos and noise, what I called a philosophy of *chaosmotechnics*.

Bios
Nadia J. Armstrong is a visual artist and practice-based PhD fellow with NCAD and CONNECT, Research Ireland's Centre for Future Networks and Communications. Her current artistic research harnesses the socio-technical imaginary to analyse systems of knowledge in the field of quantum communications. Armstrong's installations act as interfaces to alternative realities, enveloping audiences in emancipatory parafictions that deconstruct appearances of "natural order." She creates XR environments through which esoteric forms of knowledge become rituals for contemporary survival. Armstrong's newest work GIRLHERO (2025) was commissioned by the Luan Gallery, Athlone for their exhibition SYSTEM ARMING curated by Aoife Banks. The exhibition runs till November 16th. Armstrong's full bio and more information about her work is available at: nadiajarmstrong.com.

Shajara Néehilan Bensusan (formerly Hilan Bensusan) is a philosopher, performer and artist interested in the subtleties of reality. Ne holds a PhD in Artificial Intelligence from Sussex University and has been a visiting scholar in several universities including the University of Bristol, the University of Paris 8, the University of Madras at Chennai, the Veracruzana University, Lousiana State University, the University of New Mexico, the University of Granada and the Free University of Brussels. After ner doctoral research on machine meta-learning strategies, Shajara worked on the dynamics of experience, on the mobilization of bodies in desire, the excessive features that make up what is singular and the limits of process philosophy. Currently interested in the spectral – in the nature of the intertwinements of life and death – ner performance work

involves funeral art, burials, security videos, ghost apparition as well as sound art with timbres and noise spectra. Shajara's current philosophical work extends from the alternatives to the metaphysics of presence (especially in the work of Martin Heidegger, Jacques Derrida, Catherine Malabou and interpretations of the traditional Tupi-Guarani thought) to the intricacies of proximity (especially through the work of Emmanuel Levinas, Peter Sloterdijk, Martin Heidegger and literary texts around intimacy and commitment). Ne recently edited two collection of articles on Speculative Realism (in Zero and Bloomsbury, in 2024 and 2025 respectively) and is currently organizing a collection of texts on contemporary engagements with the spectral. Currently an Associate Professor at the Philosophy Department of the University of Brasília, Shajara has recently authored books including *Indexicalism: Realism and the Metaphysics of Paradox* (Edinburgh University Press, 2021), *Memory Assemblages: Spectral Realism and the Logic of Addition* (Bloomsbury, 2024) and *Spectrophilia* (Cultura e Barbárie, 2025).

John Campbell is a CONNECT PhD researcher at Maynooth University under the joint supervision of Indrakshi Dey, Nicola Marchetti, Harun Siljak and Marco Ruffini. John's background is in physics (BSc from UCD, MSc from TCD) with work experience in infrared photonics (Eblana Photonics LTD) and non-linear optics. He is a researcher in the behavior and fidelity of Quantum Networks which involves designing experiments and simulating EPR entangled states. Primarily focusing on how quantum networks display inherently chaotic behaviour as the networks are increased in size and scaled from within a lab to a wider network across existing classical network infrastructure such as in optical fibres or free space communications. John is also investigating how established principles of network synchronization among nodes and signal repeater systems can be extended to quantum information theory in general and how disorder and noise affects recoverability of quantum information from transmitter to receiver. His public Github on Quantum Network Simulations using coupled oscillator models: https://github.com/MuonRay/QuantumNetworkSimulations

Stephanie Dossou holds a PhD in Computer Science from Trinity College Dublin. Her current research focuses on quantum artificial intelligence and machine learning (QAI/QML), with particular attention to quantum generative models, quantum neural networks, and hybrid architectures. She investigates how these techniques can be applied to domains such as climate finance, ethical investing, and impact-driven decision systems, advancing both technical and societal innovation. In parallel, Stephanie works on the development and evaluation of AI foundation models, exploring pretraining strategies, safety and security evaluation, and their implications for compliance within the EU AI Act and GPAI Code of Practice. Her research also engages with Deleuzian philosophy—concepts of assemblage, rhizome, socio-technical machines, and becoming—as a lens for rethinking the theoretical foundations of quantum AI and socio-technical infrastructures. Building on her earlier practice-based concept of *Finance Art*, she continues to explore how methods and tools from finance can be reappropriated within artistic and speculative infrastructures. Her creative practice incorporates interactive systems, projection mapping, and network-based installations that critically engage with the aesthetics and politics of finance, quantum technologies, and AI. Stephanie holds an MSc in Multimedia (DCU), a Postgraduate Certificate in Intelligent Systems (De Montfort University), a BA in Arts (Sorbonne-Panthéon), and a Master's in Accountancy and Finance. She has over 25 years of experience bridging technology, finance, AI research, and art, with a current focus on advancing the emerging field of quantum AI and foundation model research.

Radek Przedpełski is a migrant digital artist and scholar lecturing in interactive digital media at Trinity College Dublin. Radek is also a Postdoctoral Research Fellow in the TCD School of Engineering working on the project "Not a Space Race. Towards a New Quantum Policy." Radek graduated from TCD with a PhD in Digital Art and Humanities, interrogating the 1970s neo-

avant-garde intermedia in the Polish People's Republic. Radek is currently writing a monograph on marginalised performance artist Marek Konieczny (1936-2022). Radek co-edited a volume on *Deleuze, Guattari and the Art of Multiplicity* (Edinburgh University Press, 2020). Radek is a curator, with Laura U. Marks, of the annual Small File Media Festival of sustainable media art hosted by Simon Fraser University (SFU), Vancouver. In 2020 Radek was a postdoctoral research fellow on the Tackling the Carbon Footprint of Streaming Media transdisciplinary project developed at SFU by Marks and ICT engineer Stephen Makonin. Radek organised a series of international conferences at TCD: Deleuze and art (2016); art and multiplicity (2018), art in the Anthropocene (2019); and chaosmotechnics (2023). Inspired by mytho-ecologies of Outer Carpathian Mountains and Éire, Radek's artistic practice explores entanglements between the earth, the cosmos, and sustainable artistic techniques. Radek presented multichannel installations at the Quadrangle Gallery, Galway; Ghent, Belgium; Vancouver's Studio T Gallery; and Seyðisfjörður, eastern Iceland. Radek also researches Polish Tatar culture; he translated a volume of Tatar *rubaiyyat* into English, taught on Turkic resonances in Polish culture and in 2021 was invited by Mercer Union gallery in Toronto to engage with the representation of Polish and Lithuanian Tatars in Erdem Taşdelen's exhibition.