

Transmathematica 2025: The 6th International Conference on Total Systems

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Submitted: 22 September 2026

Revised: 22 September 2026

Abstract

Proceedings of Transmathematica 2025: The 6th International Conference on Total Systems, hybrid online and Utrecht, Netherlands, on Monday 21st July 2025 at 13.45 - 18.00 London Time. An edited video stream of the conference is on the Transmathematica YouTube channel.

1 Proceedings

Transmathematica 2025: The 6th International Conference on Total Systems was a hybrid conference held online, with a meeting in Utrecht, Netherlands, on Monday 21st July 2025 at 13.45 - 18.00 London Time. The conference had two simultaneous online streams. Past and present authors of Transmathematica papers were invited to the scientific stream on Zoom. This invitation ensured that all participants had demonstrated their understanding of total systems and were in a position to contribute to scientific discussion. The scientific stream was mirrored to the audience stream on YouTube. The general public was invited to the audience stream and was invited to make comments and ask questions, in their stream, that participants in the scientific stream could respond to. However, in the event, there were no questions on the audience stream. An edited [video stream of the conference](#) is on the Transmathematica YouTube channel.

The conference began with a private discussion of Transmathematica business. This was followed by speaker presentations, with questions, in the online streams. The presentations were followed by private discussions, some of which took place after the conference and are reported here.

1.1 Jan Bergstra

Jan Bergstra presented *Fractions: a vertical crosscutting notion*. Secondary schools teach many informal notions of fractions. At one extreme, *fracton essentialism* says that fractions are numbers. At the other extreme, *fracton co-essentialism* says that fractions are expressions that denote a number, rather than being numbers themselves. There are many interpretations of fractions on this spectrum, without any one interpretation being in the majority.

In Bergstra's analysis, unclear notions are *landmarked* by presenting nearby *landmark terms* that are relatively clear. Thus, the ambiguous notion of a *fraction*, is landmarked by the following formal terms in a *vertical* hierarchy of increasing abstraction: *fracsign occurrence*, *fracsign*, *fracterm*, *fracvalue* or *quotient*. Here *quotient* is a synonym for *fracvalue*. In a mathematical text, it is usually the case that the word *fraction* can be disambiguated by replacing it with *fracterm*, *fracvalue* or *quotient*, though disambiguation sometimes fails, even when using the words *fracsign* or *fracsign occurrence*. The term *fraxion* is the disjunction of the five landmark terms just introduced. Where *fraction* cannot be disambiguated, it is replaced by the word *fraxion*. The terms *fraction* and *fraxion* are *cross-cutting* in that they apply to all five landmarking terms. By contrast with *vertical crosscutting*, the term *real number* is a *horizontally crosscutting* term for *Dedekind cut*, *Cauchy sequence*, and *decimal expansion*.

After the conference, Bergstra renamed *fraxion* as *fracton* and renamed *fracsign occurrence* as *fractoken*. The new sequence of increasing abstraction is: *fractoken*, *fracsign*, *fracterm*, *fracpair*, *fracvalue*.

The presentation was followed by questions.

1.2 Marcus Düwell

Marcus Düwell presented *Future Perspectives on Accusation Theory*. This theory was initially developed by Jan Bergstra, with a background in Mathematics and Informatics, and Marcus Düwell, with a background in Ethics and Political Philosophy. The website accusationtheory.com lists papers on Accusation Theory, most of which were published in Transmathematica, as follows.

Bergstra, J. A., & Düwell, M. (2021). Accusation Theory. Transmathematica. [DOI](#).

Bergstra, J. A., & Düwell, M. (2022). Accusations in the context of computer programming. Transmathematica. [DOI](#).

Bergstra, J. A. (2022). An Opinion on Promises, Threats, and Accusations In the 2022 Russo-Ukrainian War. Transmathematica. [DOI](#).

Bergstra, J. A., & Düwell, M. (2023). Special Accusation Types: Anonymous Accusation, Non-evidential Accusation, and Self-Accusation. Transmathematica. [DOI](#).

Bergstra, J. A., & Düwell, M. (2024). Extreme Accusations and the Risk of Overaccusing. Transmathematica. [DOI](#).

Bergstra, J. A., & Düwell, M. (2025). Extreme Accusations II: The Genocide Accusation. Transmathematica. [DOI](#).

Bergstra, J. A., & Düwell, M. (2025). Genocide Accusations and the Logic of Genocide. Transmathematica. [DOI](#).

An *accusation* has four formal features: an *accuser*, an *accusee*, a *scope*, and a *life cycle*.

Düwell discussed three real-life accusations. Firstly, the secret consideration of an accusation against the rector of Radboud University Nijmegen. Secondly, the public consideration of an anonymous accusation against Khadija Arib, the President of the Dutch Parliament. Thirdly, public accusations of genocide in Gaza against the government of Israel. These accusations are also discussed in the above papers.

The presentation was followed by questions.

1.3 Walter Gomide

Walter Gomide presented *Spinoral Forms: Transreal Numbers and Physics*. This is a speculative work of philosophy, not a work of theoretical physics. It is hypothesised that there is a unique point at nullity, in a multi-dimensional transreal spacetime, from which point the real spacetime of our actual universe arises. Nullity is interpreted as the set of real or complex numbers in superposition. This superposition gives rise to the specific real or complex parameters of our actual universe.

The presentation was followed by questions.

1.4 Bas van Vlijmen

Bas van Vlijmen presented *Aggregation Dynamics: an update*. He reviewed the following papers.

van Vlijmen, S.F.M. (2023). Aggregation Dynamics: From problems and solutions to a generalized ecology. Transmathematica. [DOI](#).

van Vlijmen, S.F.M. (2025). Exploration of Problem and Solution Types in Los Angeles County Smog Control 1943-1976. *Transmathematica*. DOI.

van Vlijmen, S.F.M. (2025). Problem Positions and Nineteen Instances in the Smog Control Case Los Angeles County 1943-1976. *Transmathematica*. DOI.

Aggregations are totalised actors in an ecology. These actors have limited cognitive and material resources. The Innovation Illusion says that while people believe they are being innovative they are actually just recursively applying known abstract solutions to instances of abstract problems.

Problems propagate in a directed graph where a problem gives rise to a solution, but the solution changes the world, which changed world gives rise to a new problem, and so on.

It was hypothesised that ChatGPT works by problem propagation. A prompt to ChatGPT is an initial problem, which propagates in ChatGPT's neural net to produce a chain of reasoning that seems plausible and useful to the human reader. These problem propagations in ChatGPT have been learned from problem propagations in text written by humans. If people did not repeat themselves, these text patterns would not be there. That ChatGPT works so convincingly, means these patterns are ready to be found, which can be seen as a confirmation of the Innovation Illusion. Is ChatGPT itself an innovation? It was stated that ChatGPT simulates human reasoning. There are reasons to believe simulation is not something peculiar, but is a common feature of evolution. In that case ChatGPT might fit in an ecological type and hence not be an innovation. Many would say this is far fetched. Anyhow, the notion *innovation* needs clarification.

After the conference, this initial idea and the discussion led to the following Transmathematica paper.

van Vlijmen, S.F.M., & Lethe jr, H.D. (2026). Some hypotheses on how Chatbots work in problem-solution-driven conversations: Large Language Models as confirmation of the Innovation Illusion. *Transmathematica*. DOI.

The presentation was followed by questions. James Anderson stated: "Aggregation Dynamics describes people on a treadmill, always going around, solving a problem, new problem, solving a problem, new problem. Do you see any hope of getting off the treadmill?"

Bas answered that in his view we can slow the treadmill down. By doing so we make one another less crazy, with constant change, and gain time to enjoy life. But we cannot stop the treadmill, it is a trap driven by the increase of entropy. Jan Bergstra added: "Isn't that innovation, getting out of the treadmill?" Bas answered, sensing Jan was looking for a solution to stop the treadmill, with "no." No, because you just step into another treadmill. But Jan had a metaphorical point here. In hindsight, what change to a treadmill do we regard as an innovation? This is what Bas would like to sort out too. We left it at that.

1.5 James Anderson

James Anderson presented *Principia Transmathematica*, which is a summary of the following two books.

James Anderson, Built on Sand: how to divide by zero and thereby save science from guaranteed failure, Amazon Kindle, 2023. [URL](#).

James Anderson, Principia Transmathematica, Amazon Kindle, 2025. [URL](#).

The first edition of Principia Transmathematica describes Anderson's view of total systems and contains a blueprint for future research. A second edition is planned to contain chapters by people who have done research on total systems with Anderson. Authors will be invited to summarise their life's work or to provide an entry point to it. A third edition is planned to contain chapters by anyone who has researched total systems.

The first edition of Principia Transmathematica has sections on: an introduction to total systems, transymbols, translogic, transets, philosophy of totality, transreal arithmetic, the empty symbol ϵ , transphysics, transcomputation, and an epilog.

Anderson presented: a total transet theory with unlimited comprehension; infinite spacetime acceleration of a Turing machine so that it can decide all questions; and twelve pedagogic steps to advance from real arithmetic to transreal arithmetic.

After the conference, Anderson specified that every logical question is answered by two oracles: the true oracle truthfully reports true or else does not make a report, which is a gap; the false oracle truthfully reports false or else does not make a report, which is a gap. The combination of these reports classifies the answer in exactly one of the four regions of a transet, which is to say that the classification is immune to meta contradictions. In the absence of logically omniscient oracles, who have logically monotonic reasoning, we may have auto-epistemic oracles, who know only what they know, and who generally have logically non-monotonic reasoning. The auto-epistemic oracles obtain classifications to the best of their current knowledge. By virtue of being classifications, their answers are immune to meta contradictions at the time they are produced. Thus, meta contradictions are blocked by both logically omniscient and auto-epistemic oracles. The auto-epistemic oracles include human thinkers.

The presentation was followed by questions.

2 Learnings for Future Conferences

Use just one laptop in each physical meeting so that set up and testing only needs to be done once.

Use a Blue Tooth microphone instead of relying on a laptop's built in microphone. This would give better sound and make it easier for different people to speak during questions and plenary discussions.

Report only the business that takes place at the conference so that conference proceedings can be published more quickly.