# TS5: Thematic Session: Automated Reasoning and the Future of Mathematical Practice

Thursday 3 July, 11:00–12:30 • Room 122

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**Tom Goertzen** (University of Sydney)

Time: 11:00–11:30

### Extracting Proofs from Magma into Lean

Lean is a powerful language for computer-verified proofs. However, entering every detail by hand can be tedious, especially for large examples. In this talk, I will present a framework for extracting data and examples from MAGMA into Lean. The guiding example, for this talk, will be the Mathieu group M11. I will also touch on current challenges and possible future directions. This talk is based on joint work with Ashvni Narayanan.

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**João Araújo** ( NOVA University of Lisbon)

Time: 11:30–12:00

### An Overview of ProverX: Capabilities and Achievements

ProverX is a flexible system for automated reasoning, whose kernel integrates both theorem provers and finite model builders. On top of this core, ProverX supports a modular architecture that allows the addition of specialised packages tailored to particular classes of mathematical problems. In this talk, I will provide a brief overview of the system's structure, capabilities, and some of its most significant successes.

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**Ursula Martin** (University of Oxford)

Time: 12:00–12:30

### Will machines change mathematics?

A 2024 collection of articles in the Bulletin of the AMS asked "Will machines change mathematics?", suggesting that "Pure mathematicians are used to enjoying a great degree of research autonomy and intellectual freedom, a fragile and precious heritage that might be swept aside by a mindless use of machines." and challenging readers to "decide upon our subject's future direction." This talk will be a high-level, and possibly not entirely serious, approach to thinking about the factors, whether technical, social or economic, leading to the ongoing adoption, or otherwise, of computational interventions in mathematical practice, whether contemporary AI or 20th century computational group theory.

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