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沖縄科学技術大学院大学

VISITING PROGRAM

TSVP TALK

Numerically Verified Proofs in Geometry and Beyond

2026

THU.

Oct. 8

15:00–16:00

HYBRID

L5D23, ZOOM



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When solving an equation like $x^2-2=0$, a computer will readily produce an approximate solution $x=\pm 1.4142$. The idea of numerically verified proofs is to use a fixed point theorem to prove that a genuine solution exists near this approximate solution. For polynomials, there are other tricks that one could use. But in recent years, computers have become powerful enough to use this approach for solving PDEs where it can crack problems no other approach can. In the talk I will explain how this technique works abstractly, and then apply it to a PDE on the 2-sphere called the "Nirenberg problem" in some detail (see arXiv:2603.29544). Numerically verified proofs are a very general technique that can be applied to many different problems, and in the last five minutes I will mention suitable problems in geometry. I will also mention suitable problems in other areas about which I know little.



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Daniel is a research fellow at Imperial College London working on numerical methods applied to differential geometry. He obtained his PhD in differential geometry from Imperial College in 2022 and since then worked as postdoc at King's College London and Imperial College London.

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