

LUE PAN WINS THE 2026 DAVID GOSS PRIZE

The David Goss Prize in Number Theory is awarded to Lue Pan for his outstanding contributions to arithmetic geometry, the theory of automorphic forms, and p -adic representations. The David Goss Prize is awarded to mathematicians under the age of thirty-five for exceptional contributions to number theory and is dedicated to the memory of David Goss, former editor-in-chief of the Journal of Number Theory.

Lue Pan's work has transformed the study of the relationship between Galois representations and automorphic forms. A first major achievement is his proof of the remaining odd, regular, two-dimensional cases of the Fontaine–Mazur conjecture. Earlier breakthroughs of Kisin and Emerton had established many important cases, particularly when the residual Galois representation is irreducible, while work of Skinner–Wiles and others treated certain residually reducible ordinary cases. The residually reducible and non-ordinary case, however, had remained inaccessible. Pan overcame this fundamental obstacle and obtained a complete modularity theorem in this setting.

A second major achievement of Pan is the development of a new geometric approach to completed cohomology, one of the central objects connecting automorphic forms and Galois representations. He discovered unexpected structures in completed cohomology that reveal how p -adic analytic and arithmetic properties are encoded geometrically. These ideas led to a conceptual understanding of when p -adic Galois representations arise from overconvergent modular forms and, in many cases, from classical modular forms. They also resolved longstanding conjectures concerning the relationship between completed cohomology and p -adic automorphic forms.

Pan then introduced a geometric framework for understanding de Rham structures in completed cohomology. This work provided a completely new proof of a fundamental classicality theorem, replacing methods that relied on the highly specialized p -adic local Langlands correspondence for $\mathrm{GL}_2(\mathbf{Q}_p)$. His approach is expected to extend far beyond the setting where previous techniques apply, offering a promising route toward major open problems involving higher-rank groups and more general Shimura varieties.

Beyond his individual theorems, Pan's work has been distinguished by the originality and lasting influence of its ideas. His methods have already become essential tools in subsequent breakthroughs on modularity, Shimura varieties, automorphic forms, and symmetric-power functoriality, inspiring advances far beyond the problems for which they were originally developed. Through only a handful of exceptionally deep and substantial papers, he has introduced new theories, resolved longstanding conjectures, and created powerful techniques that are reshaping modern arithmetic geometry and are expected to influence the field for many years to come. For these profound accomplishments, Lue Pan is awarded the David Goss Prize.

The members of the 2026 Prize Committee were: Ziyang Gao (UCLA, USA), Dorian Goldfeld (Columbia University, USA), Philippe Michel (École Polytechnique Fédérale de Lausanne, Switzerland), Emmanuel Ullmo (IHES, France), Umberto Zannier (Scuola Normale Superiore, Italy), and Shou-Wu Zhang (Princeton University, USA).