INTERNATIONAL MATHEMATICAL UNION

# FIELDS MEDAL 2026

## JACOB TSIMERMAN

### SHORT CITATION

For his contribution in the recasting of o-minimality as a fundamental method of arithmetic and complex algebraic geometry, and his role in the proof of many central conjectures including Griffiths' conjecture on the algebraicity of images of the period maps, and the André-Oort conjecture for Siegel modular varieties.

### LONG CITATION

Extending the method of o-minimality and combining it with ideas from a broad range of areas of mathematics, Jacob Tsimerman, with his collaborators, has solved several major problems in arithmetic and complex algebraic geometry.

The development of o-minimal theory in the holomorphic setting was initiated by Peterzil and Starchenko, who established an affine version of Chow's algebraicity theorem. With Bakker and Brunebarbe, Tsimerman extended this theory to a full-fledged GAGA theorem over possibly non-reduced complex spaces. Combining it with the earlier work of Bakker, Klingler and Tsimerman that placed period maps in the o-minimal domain, they proved Griffiths' conjecture on the algebraicity of images of the period maps, a long-standing problem in Hodge theory.

The André-Oort conjecture was a central problem in the Diophantine geometry of Shimura varieties, predicting subvarieties containing many special points are special subvarieties. Following a proof assuming the generalized Riemann hypothesis by Edixhoven, Klingler, Ullmo and Yafaev, Pila and Zannier formulated a strategy for an unconditional proof, using o-minimality via the Pila-Wilkie estimates. Tsimerman played a key role in the development, contributing to the two parts of the Pila-Zannier strategy: Galois lower bounds (using the average Colmez conjecture as a key ingredient) and functional transcendence (Ax-Lindemann, obtained jointly with Pila). As a consequence, Tsimerman completed the proof for Siegel modular varieties.

A stronger functional transcendence statement, Ax-Schanuel, is of interest on its own and in connection with the Zilber-Pink conjecture. Mok, Pila and Tsimerman have used o-minimality combined with number-theoretic and geometric techniques to prove the Ax-Schanuel conjecture for Shimura varieties. With Bakker, and using general Ax-Schanuel results obtained independently by Blazques-Sanz, Casales, Freitag and Nagloo, by Chiu and by Gao-Klingler, Tsimerman formulated and proved a functional version of the André-Grothendieck conjecture on transcendence of periods.