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Periods of integrals - interactions of Transcendence theory and Arithmetic

Many important mathematical constants and functions can be expressed as period integrals, both definite and indefinite. The study of their transcendence - and the existence of algebraic relations between them - is historically central to the study of algebraic curves and algebraic geometry. We shall discuss what is conjectured in both settings, some recent results in the functional setting, and some surprising connections to arithmetic.