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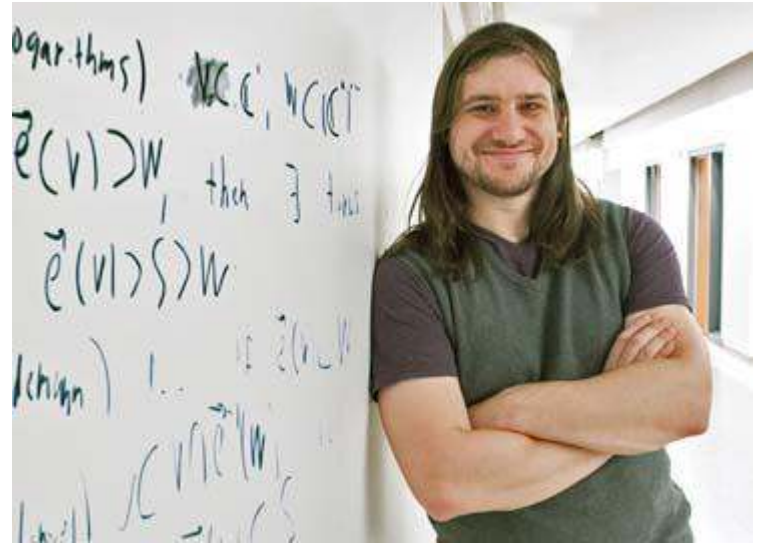
Friday

Sept. 22, 2023

3:30 PM

Zoom and
Viewing Party
in Room:

CW307.20



Transcendence of period integrals over function fields

Periods are integrals of differential forms, and their study spans many branches of mathematics, including diophantine geometry, differential algebra, and algebraic geometry. If one restricts their attention to periods arising over \mathbf{Q} , then the Grothendieck Period Conjecture is a precise way of saying that these are as transcendental as is allowed by the underlying geometry. While this is a remarkably general statement (and very open), it does not include another major (also open!) conjecture in transcendence theory - the Schanuel conjecture. In particular, e is not a period, even though it can be described through periods via the relation that the integral from 1 to e of dx/x is 1. We shall present a generalization due to André which unifies the two conjectures in a satisfactory manner.

In the (complex) function field case, a lot more is known. The Grothendieck Period Conjecture has been formulated and proved by Ayoub and Nori. We shall explain the geometric analogue of the André - Grothendieck Period Conjecture and present its proof. It turns out that this conjecture is (almost) equivalent to a functional-transcendence statement of extreme generality known as the Ax-Schanuel conjecture, which has been the subject of a lot of study over the past decade in connection with unlikely intersection problems. The version relevant to us is a comparison between the algebraic and flat coordinates of geometric local systems. We will explain the ideas behind the proofs of this Ax-Schanuel conjecture and explain how it implies the relevant period conjecture.

Live streamed on Zoom. Register in advance for link:

<https://uregina-ca.zoom.us/meeting/register/tJUpeGupzouHtx5zdh8VZwiADnblcqN-fEZ>