

Abstracts

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Functional Transcendence and the Model Theory of Differential Fields

Over the past 15 years, following the work around the Pila-Wilkie counting theorem in the context of o-minimality, there has been a surge of interest in functional transcendence results - in part due to their connection with special points conjectures. A prime example is the Ax-Lindemann-Weierstrass (ALW) theorem and its role in the proof of the André-Oort conjecture.

We will give an overview of how, over the past decade, an entirely new approach - using the model theory of differential fields as well as other differential tools - has been used to establish functional transcendence results (including ALW) for several classical/special functions. We will also describe how work on these transcendence results has raised interesting questions about the model theory of differential fields.

[Back to Contents Page](#)

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O-minimal Structures: From Basics to Applications

In these talks, we start with some history and cover some very basics of abstract o-minimality.

Next, we consider o-minimal expansions of ordered fields and establish various smoothness properties for them. We also consider definable manifolds. As the next step, we consider complex analytic sets definable in o-minimal structures. We state Pila-Wilkie counting theorem and give an example of its application. We outline a proof Ax-Lindemann-Weierstrass Theorem that uses basics of o-minimality and does not use differential algebra. If the time permit, we also discuss definability of certain rational factors.

[Back to Contents Page](#)