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**Arithmetic aspects of the Burkhardt quartic threefold.** (English) Zbl 1446.11111  
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Summary: We show that the Burkhardt quartic threefold is rational over any field of characteristic distinct from 3. We compute its zeta function over finite fields. We realize one of its moduli interpretations explicitly by determining a model for the universal genus 2 curve over it, as a double cover of the projective line. We show that the  $j$ -planes in the Burkhardt quartic mark the order 3 subgroups on the abelian varieties it parametrizes, and that the Hesse pencil on a  $j$ -plane gives rise to the universal curve as a discriminant of a cubic genus 1 cover.

**MSC:**

- 11G10** Abelian varieties of dimension  $> 1$
- 11G18** Arithmetic aspects of modular and Shimura varieties
- 11G30** Curves of arbitrary genus or genus  $\neq 1$  over global fields
- 14G10** Zeta functions and related questions in algebraic geometry (e.g., Birch-Swinnerton-Dyer conjecture)
- 14H10** Families, moduli of curves (algebraic)
- 14K10** Algebraic moduli of abelian varieties, classification

Cited in 1 Document

**Keywords:**

Burkhardt quartic threefold; Hesse pencil

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