



Mathematics > Algebraic Geometry

The Barth quintic surface has Picard number 41

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This paper investigates a specific smooth quintic surface suggested by Barth for it contains the current record of 75 lines over the complex numbers. Our main incentive is to prove that the complex quintic has Picard number 41, and to compute the Neron-Severi group up to a 2-power index. We also compute Picard numbers for reductions to positive characteristic and verify the Tate conjecture.

Comments: 16 pages; v2: revised and expanded, specifically added Section 5 to compute NS up to index 16

Subjects: **Algebraic Geometry (math.AG)**

MSC classes: 14J29, 11G25, 11G35, 14J27, 14J28

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