

Luroth (or Lüroth), Jakob | Encyclopedia.com

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(b. Mannheim, Germany, 18 February 1844; d. Munich, Germany, 14 September 1910)

mathematics.

Luroth's first scientific interests lay in astronomy. He began making observations while he was still in [secondary school](#), but since he was hampered by bad eyesight he took up the study of mathematics instead. He attended the universities of Heidelberg, Berlin, and Giessen from 1863 until 1866; he had already, in 1865, written his doctoral dissertation on the Pascal configuration. In 1867 he became *Privatdozent* at the University of Heidelberg, and two years later, when he was still only twenty-five years old, he was appointed professor ordinarius at the Technische Hochschule in Karlsruhe. From 1880 until 1883 he taught at the Technische Hochschule of Munich, and from the latter year until his death, at the University of Freiburg.

Luroth's first mathematical publications were concerned with questions in analytical geometry, linear geometry, and theory of invariants, a development of the work of his teachers Hesse and Clebsch. His name is associated with three specific contributions to science. The first of these, a covariant of a given ternary form of fourth degree, is called the "Luroth quartic," and Luroth discovered it when he examined, following Clebsch, the condition under which a ternary quartic form may be represented as a sum of five fourth-powers of linear forms. In 1876 he demonstrated the "Luroth theorem," whereby each uni-rational curve in rational—Castelnuovo in 1895 proved the analogous but more difficult theorem for surfaces. Finally, the "Clebsch-Luroth method" may be employed in the construction of a Riemann surface for a given algebraic curve in the complex plane.

In addition, Luroth worked in other areas of mathematics far removed from [algebraic geometry](#). He obtained partial proof of the topological invariance of dimension (proved in 1911 by L. Brouwer) and, following the work of Staudt, did research in complex geometry. He was also involved in the logical researches of his friend Schröder and published two books in applied mathematics and mechanics. These were *Grundriss der Mechanik*, in which he used the vector calculus for the first time* and *Vorlesungen über immerisches Rechnen*. Luroth collaborated in editing the collected works of Hesse and Grassmann.

BIBLIOGRAPHY

I. Original Works. A complete bibliography of Luroth's works may be found in the Brill and Noether obituary (see below). The papers containing his main discoveries are "Einige Eigenschaften einer gewissen Gattung von Kurven 4. Ordnung," in *Mathematische Annalen*, **2** (1869), 37-53; "Das Imaginäre in der Geometrie und das Rechnen mit Würfeln," *ibid.*, **8** (1875), 145-214; "Beweis eines Satzes über rationale Kurven," *ibid.*, **9** (1876), 163-165; and "Über die kanonischen Querschnitte einer Riemannschen Fläche," in *Sitzungsberichte der physikalisch-medizinischen Gesellschaft in Erlangen*, **15** (1883), 24-30. He also published *Grundriss der Mechanik* (Munich, 1881), and *Vorlesungen über numerisches Rechnen* (Leipzig, 1900).

II. Secondary Literature. An obituary is A. Brill and M. Noether, "Jacob Luroth," in *Jahresberichte der Deutschen Mathematiker-Vereinigung*, **20** (1911), 279-299.

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