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(*b.* Chioggia, Italy, 7 May 1854; *d.* Padua, Italy, 17 July 1917)

*mathematics.*

Giuseppe Veronese, professor of geometry at the University of Padua from 1881 until his death, was one of the foremost Italian mathematicians of his time. He took part also in political life, first as a member of Parliament for Chioggia (1897–1900), then as a member of the City Council of Padua, and finally as a senator (1904–1917).

Veronese's father was a house painter in Chioggia, then a small fishing town not far from Venice; his mother, Ottavia Duse, was a cousin of the celebrated actress Eleonora Duse. In 1885 Veronese married the Baroness Beatrice Bartolini; they had five children. Veronese was a handsome man, tall and commanding, but in his last years his health was undermined by influenza, which he had contracted in 1912 and which left him with grave cardiovascular disorders.

Because of his parents' poverty, Veronese had to interrupt his studies when he was eighteen and take a minor job in Vienna; but through the generosity of Count Nicolò Papadopoli he was able to resume his studies a year later, first at the Zurich Polytechnic, where he studied engineering and mathematics under Wilhelm Fiedler, and later, following a correspondence with Luigi Cremona, at the University of Rome, from which he graduated in 1877. In the previous year he had become assistant in analytical geometry, an unheard-of distinction for an undergraduate, after demonstrating his exceptional abilities in a paper on Pascal's hexagram, a work he had begun at Zurich. In 1880–1881 Veronese did postgraduate study at Leipzig. Immediately afterward, he won the competition for the professorship of complementary algebra and [algebraic geometry](#) at the University of Padua, where he succeeded Giusto Bellavitis. The latter had shown personal liking for Veronese but was fiercely opposed to the new approaches to geometry, which Veronese supported.

Veronese published only about thirty papers; but some of them, also available in German, were extremely important in the history of geometry. In particular he may be considered the main founder of the projective geometry of hyperspaces with  $n$  dimensions, which had previously been linear algebra presented geometrically, rather than geometry. Hyperspaces began to assume a more truly geometrical aspect when Veronese used an original recursion method to produce them; a plane can be obtained by projecting the points of a straight line from a point outside it, and a three-dimensional space by projecting the points of a plane from a point outside it, and so on. He is also remembered for "Veronese's surface," a two-dimensional surface of a five-dimensional space, which in its simplest expression can be represented by the parametric equations  $x_1 = u^2$ ,  $x_2 = uv$ ,  $x_3 = v^2$ ,  $x_4 = u$ ,  $x_5 = v$ , where  $x_1, \dots, x_5$  are the nonhomogeneous coordinates of the space and  $u$  and  $v$  are two independent parameters. The study of this surface is equivalent, from the point of view of projection, to the study of all the conics of a plane; and one of its projections in ordinary space is Steiner's Roman surface.

Veronese was also one of the first to study non-Archimedean geometry, at first arousing strong opposition, and he demonstrated the independence of Archimedes' postulate—which states that among the multiples of a given magnitude there is always one greater than every fixed magnitude—from the other postulates of geometry. Veronese also wrote useful books for the secondary schools.

Veronese was a member of the Accademia Nazionale dei Lincei and of other Italian academies; and his pupils included Guido Castelnuovo and [Tullio Levi-Civita](#)

When a member of Parliament, Veronese campaigned strenuously for the conservation of the Lagoon of Venice.

## BIBLIOGRAPHY

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