

**Issai Schur (1875–1941)
and the early development of
the Schur complement:
photographs, documents and biographical
remarks**

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Abstract

We comment on the development of the Schur complement from 1812 through 1968 when it was so named and given a notation by Emilie Virginia Haynsworth (1916–1985). The adjectival noun “Schur” was chosen because of the *Hilfssatz* in the paper by Issai Schur (1875–1941) published in 1917 in the *Journal für die reine und angewandte Mathematik* (vol. 147, pp. 205–232), in which the *Schur determinant formula* was introduced. Following some biographical remarks about Issai Schur, we present the *Banachiewicz inversion formula* for the inverse of a nonsingular partitioned block matrix which was introduced in 1937 by the astronomer Tadeusz Banachiewicz (1882–1954). We note, however, that closely related results were obtained earlier in 1923 by the geodesist Hans Boltz (1883–1947) and in 1933 by Ralf Lohan. We illustrate our findings with several photographs and copies of original documents.

[Joint research with Simo Puntanen (University of Tampere) supplementing Chapter 0 in *The Schur Complement and Its Applications*, Series: Numerical Methods and Algorithms 4 (Fuzhen Zhang, ed.), Springer 2005; see also *Issai Schur (1875–1941) and the Early Development of the Schur Complement, with Applications to Statistics and Probability* by Simo Puntanen & George P. H. Styan, Report A 346, Dept. of Mathematics, Statistics & Philosophy, University of Tampere, July 2004.]