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$SL_2(\mathbf{R})$, by Serge Lang, Addison-Wesley Publishing Co., Reading, Massachusetts, 1975, 425 + xvi pp., $19.50.

Given the formalism of quantum mechanics, the study of those of its laws which are invariant under the Lorentz group inevitably leads to infinite-dimensional representations of both the homogeneous and inhomogeneous forms of the group. Responding to earlier work of Dirac and Wigner, Bargmann, Gelfand-Naĭmark, and Harish-Chandra published in 1946 and 1947 classifications of the unitary representations of the homogeneous Lorentz group, or rather of a covering group, SL(2, **C**). Bargmann, because he was interested in the representations of the inhomogeneous group, was led as well to classify the representations of SL(2, **R**), a covering group of the Lorentz group in three variables, two in space and one in time.

From these innocent beginnings the mathematical theory of infinite-dimensional representations has expanded relentlessly, forgetting its origins in physics but encroaching on other domains of mathematics, especially number theory, to which its methods, those of functional analysis with a heavy admixture of Lie theory, have been foreign. Since the training of many contemporary number-theorists has been primarily algebraic, even those who view the new methods with favor find them difficult to assimilate. Some simple introductions are needed, not so much to expose the techniques, or even the basic concepts, but just to pierce the tough rind of unfamiliarity. Such is the purpose of $SL_2(\mathbf{R})$. It is a rough-hewn book, leisurely and informal, which in the manner of a good graduate course, conscientiously explains the heterogeneous facts from various domains which could be stumbling blocks for the novice, and may be exactly what is needed.

Bargmann, to whose paper many later students have turned for an introduction to the subject, discovered in particular a discrete series of irreducible representations of SL(2, **R**) with square-integrable matrix coefficients. It is remarkable that most of the phenomena which are significant for the general theory, not only the discrete series, whose importance cannot be exaggerated, but also other things more easily overlooked, appear already in SL(2, **R**); those who are led through it by an experienced guide will, if they later penetrate the general theory, meet nothing totally unfamiliar.

But one does not reach new continents by skirting the coasts of home. The physicist is concerned almost exclusively with the internal structure of the