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Lehrbuch der Mathematischen Physik, vol. 3, *Quantenmechanik von Atomen und Molekülen*, by W. Thirring, Springer-Verlag, Vienna-New York, 1979, x + 263 pp., $19.80.

Mathematical physics is a remarkable enterprise on the borderline between two intellectual disciplines. Its practitioners do mathematics, of course, though they are inclined to deny this when confronted by their physicist colleagues. But, unlike in pure mathematics, the subjects and problems in mathematical physics are determined, at least to some extent, by extra-mathematical considerations, such as relevance (however tenuous occasionally) to some aspect of physics, or the desire to explore mathematical phenomena whose very existence is suspected only because of the belief that this or that mathematical model describes some empirically known phenomenon. But how does one learn mathematical physics? A mathematician, with professional knowledge of the basics in a number of areas of modern mathematics, may decide to learn physics. A more usual pattern is that one knows physics to start with, and a desire to do things rigorously, to search for precision and logical clarity, to look for simplicity and well-defined structures, leads one to learn the mathematics relevant to a particular physical subject gradually. In either case, one of the difficulties for the novice is the virtual absence of physics textbooks that take the point of view of mathematical physics seriously from the beginning. There is the research literature, of course, and there are "mathematical methods" books. Both are useful, but do not fill the needs of those who may want to learn physical theory, but insist on the precision and clarity that only mathematics allows. For these reasons the appearance of Thirring's book is a very welcome addition to the literature on quantum mechanics. That subject is one of the great intellectual creations of our century, and is the foundation for the understanding–such as it is–of the structure of matter. No wonder that books on it pour into major university libraries at a rate that at times seems to exceed their capacity to catalogue them. But much of this literature is repetitious, and hardly any improvement over what was available twenty, indeed forty years ago. But the Thirring book is a new departure. It is a text on quantum mechanics, yes; but it is written fully in the spirit of mathematical physics, and incorporates much interesting research done in the last twenty years. It is the third volume in a series, the first two of which appeared earlier, with a fourth volume promised, and the set, when complete, will represent a modern *Course of theoretical physics* as a worthy successor of classics of an earlier era such as the Sommerfeld series, the lectures of Pauli, or the Landau-Lifschitz series. Of course, not everyone will want to learn quantum theory (or any other subject of physics) with such emphasis on mathematical rigor, perhaps not even mathematicians, but for those who do there is now a text fully satisfying their needs.

Quantum mechanics, among other physical subjects, is peculiarly suited for a treatment that insists on the precision and, more importantly perhaps, on the spirit of contemporary mathematics. For this there are actually two