

Sasane, A.: *A Mathematical Introduction to General Relativity.* XVI, 483 pp.,
World Scientific, New Jersey London Singapore, 2022. EUR 140,00.

This is a friendly introduction to smooth manifolds and the foundations of general relativity, geared towards advanced undergraduate or beginning graduate students. The prerequisites therefore are rather modest and the author carefully introduces all the required notions like manifolds, vector-, covector- and tensor fields, linear connections, Lorentzian metrics, geodesics, curvature, and integration, which roughly amounts to the first half of the book. Relativity is then first considered in the case of Minkowski spacetime. This is followed by chapters on matter, the field equations, black holes, and an outlook on cosmology. The scope of the book is roughly comparable to the standard textbook by B. O'Neill, albeit with a slightly more elementary selection of topics. Throughout, the author takes great care to motivate mathematical concepts by physical arguments, provides detailed proofs and gives many worked out examples. A particularly attractive feature of this work is the large number of exercises, including a complete set of solutions. Altogether, this is a friendly introduction to mathematical general relativity that lends itself nicely either as course material or for self-study.

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