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## Review: A short introduction to de Branges-Rovnyak spaces

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**MR3309347 (Review)** [47B32](#) [47A45](#)

**Timotin, Dan** (R-AOS)

**A short introduction to de Branges–Rovnyak spaces. (English summary)**

*Invariant subspaces of the shift operator*, 21–38, *Contemp. Math.*, 638, Amer. Math. Soc., Providence, RI, 2015.

The author provides a short introduction to de Branges–Rovnyak spaces. This inviting survey is well written and will be an excellent introduction for the interested graduate student. Complete proofs are given for some of the later material, but most of the basic results are proposed as simple exercises for the reader to complete.

The topics covered are fairly standard, as they should be for such a survey. After some preliminaries, the author discusses reproducing kernels, contractive inclusion, ramifications of the extreme/non-extreme dichotomy for  $\mathcal{H}(b)$  spaces, and the model theory for contractions with defect  $(1, 1)$ . This last topic is developed in detail, with a careful proof being given. Matrix and operator-valued de Branges–Rovnyak spaces are not considered here, although references to more advanced sources point the reader in the right direction.

Two more comprehensive references on the subject of de Branges–Rovnyak spaces are D. E. Sarason’s classic text [*Sub-Hardy Hilbert spaces in the unit disk*, Univ. Arkansas Lecture Notes Math. Sci., 10, Wiley, New York, 1994; [MR1289670](#)] and the recent text of J. Mashreghi and E. Fricain. Here the author refers to [in *Proceedings of the St. Petersburg Mathematical Society. Vol. XIII*, 163–170, Amer. Math. Soc. Transl. Ser. 2, 222, Amer. Math. Soc., Providence, RI, 2008; [MR2433525](#)], but I believe that his intent was to refer to their massive two-volume text *The theory of  $H(b)$  spaces* [Cambridge Univ. Press, New York, 2014].

{For the collection containing this paper see [MR3309345](#)}

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