

Isabelle Chalendar

Université de Lyon, France
chalenda@math.univ-lyon1.fr

Modern approaches to the invariant subspace problem

The main reference is my book with Jonathan Partington, with the same title.

First lecture: Introduction to this famous open problem in operator theory.

We review well-known classes of operators for which we can assert that they have nontrivial invariant subspaces. We also list some counterexamples, as well as recent interesting results in this field.

Second lecture: Contractions with rich spectrum.

We will present a deep and fairly recent positive theorem due to Ambrozie and Muller, extending the existence of invariant subspaces for contractions on Hilbert space whose spectrum contains the unit circle based on dual algebra theory (Brown, Chevreau, Pearcy 1988).

Third lecture: Generalization of compact operators.

We introduce the notion of strictly singular and finitely strictly singular operators on Banach spaces, and we provide an example of finitely strictly singular operator with no nontrivial invariant subspace (the construction is due to C. Read).