Divergence form operators in L^p: good and bad news

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We consider elliptic differential operators in divergence form with bounded, measurable, complex coefficients in L^p. These operators are dissipative when $p = 2$ and, by the Lumer-Phillips Theorem, they generate contraction semigroups. For other values of p, it may or may not happen that the semigroup is bounded. Typically, positive results depend on algebraic restrictions of the coefficient-matrix and negative results come from the failure of the De-Giorgi—Nash—Moser Theory for operators with complex coefficients.

I will give a gentle introduction to the topic and include some recent results from joint work with Tim Böhnlein (TU Darmstadt).