

Frankfurter Seminar

Kolloquium des Instituts für Mathematik

Sommersemester 2024

Frankfurter Seminar, 24. April 2024

Wolfgang Arendt (Universität Ulm)

The Dirichlet Problem without the Maximum Principle

In the first part of the talk we recall known results on the Dirichlet problem for the Laplacian. We will mention the Dirichlet Principle, the Perron solution, Wiener's characterization of well-posedness via a capacity condition and several further beautiful results. The fundamental De Giorgi-Nash Theorem allowed Stampacchia and coauthors to extend many of these results to elliptic operators (instead of the Laplacian). For these generalizations the maximum principle plays an important role; it is valid only if the coefficients of the operator satisfy a certain divergence condition.

In 2019 we succeeded to prove many of the well-posedness results without that the maximum principle holds. The only condition we need is that 0 is not a Dirichlet eigenvalue, which is equivalent to uniqueness in the Dirichlet problem. The Perron solution is a special challenge in this general setting, and diverse equivalent descriptions could be given recently. The most interesting one is even new for the Laplacian. These results are contained in the following two articles:

W. Arendt, T. ter Elst: The Dirichlet Problem without the Maximum Principle. Ann. Inst. Fourier, Grenoble, 69 (2019) 763-782.

W. Arendt, T. ter Elst, M. Sauter: The Perron Solution for Elliptic Equations without the Maximum Principle. Math. Ann. 2024.

Tee ab 16:15 Uhr

Robert-Mayer-Straße 10 | Raum 711

Ginkgo-Seminar 15:15 - 16:00 Uhr

Tobias König Dirichlet, Perron & Co. - an introduction to elliptic equations

Teilnahme nur für Studierende, Promovierende und Postdocs

Tee 16:15 - 16:45 Uhr

