

Einladung

# Würzburger Mathematisches Kolloquium

Julius-Maximilians-Universität Würzburg • Institut für Mathematik

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# Finding Ellipses: Blaschke Products and the Numerical Range

Dienstag, 28. April 2026 • 14:15 Uhr

Seminarraum 0.002 • Zentrales Hörsaal- u. Seminargebäude Z6 (Am Hubland, 97074 Würzburg)

Der Vortrag wird auch als Zoom-Meeting übertragen: [go.uni-wue.de/ifmcolloquium-zoom](https://go.uni-wue.de/ifmcolloquium-zoom)

**Abstract.** The numerical range of an  $n \times n$  complex matrix  $A$  is defined by

$$W(A) = \{ \langle Ax, x \rangle : x \in \mathbb{C}^n, \|x\| = 1 \}.$$

In general, it's not easy to compute the shape of the numerical range. In this talk, we investigate the question of when numerical ranges of matrices are elliptical by connecting this phenomenon to two seemingly different settings: function theory and projective geometry. Starting with  $n = 2$  and extending to general  $n$  leads to a class of operators known as compressions of the shift operator. This viewpoint provides new insight into the numerical ranges of these operators and highlights special features that emerge when the numerical range is an ellipse.

