

Dear Colleagues!

Institute of Mathematics of the University of Georgia is pleased to invite you to the Online Tbilisi Analysis & PDE Seminar. The seminar is held bi-weekly on Tuesdays at 20 : 00 local time in Tbilisi.

Talk on February 06, 2024

Speaker: Prof. em. **Elias Wegert**, Institute of Applied Analysis, TU Bergakademie Freiberg, 09596 Freiberg, Germany;

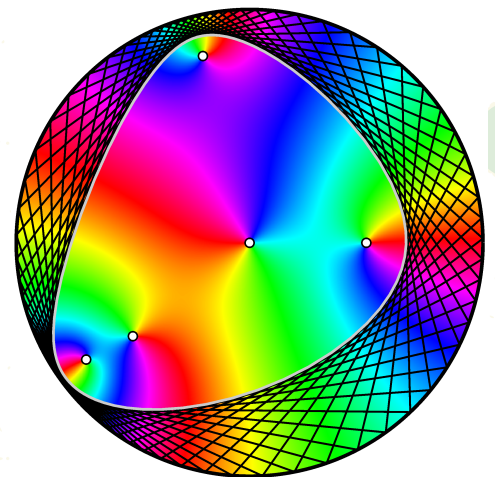
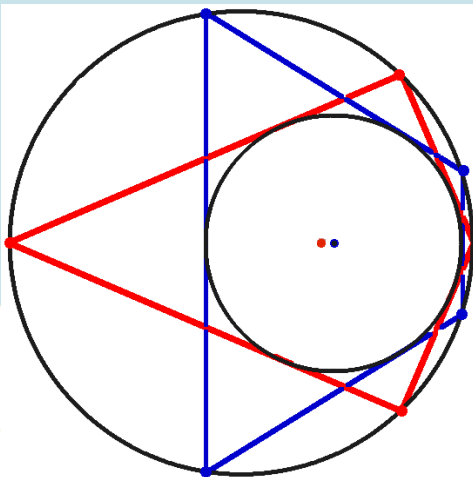
E-mail: wegert@math.tu-freiberg.de; https://de.wikipedia.org/wiki/Elias_Wegert

The title of the lecture: “Numerical range, Blaschke products, and Poncelet polygons”

Abstract: In 2016, Gau, Wang and Wu conjectured that a partial isometry A acting on a n -dimensional complex Hilbert space cannot have a circular numerical range with a non-zero centre. In this talk, we verify this for operators with rank $A = n - 1$.

The proof is based on the unitary similarity of A to a compressed shift operator generated by a finite Blaschke product B . We then use the description of the numerical range by Poncelet polygons associated with B , a special representation of Blaschke products related to boundary interpolation, and an explicit formula for the barycenters of the vertices of Poncelet polygons involving elliptic functions.

The talk is a mixture of operator theory, plain geometry, and elementary complex analysis. In particular, we give a short introduction to the visualization of complex functions by “phase plots” and demonstrate how they can help to discover relevant properties of these functions.



The image on the left shows two Poncelet polygons inscribed between two circles and the barycenters of their vertices. On the right-hand side, we see a family of Poncelet polygons in the phase plot of a Blaschke product of degree 5.

Date: February 06, 2024

Time: 20 : 00 local time in Tbilisi;

(Compare to your local time: <https://www.timeanddate.com/worldclock/georgia/tbilisi>);

How to join:

The seminar is organized on the **Cisco Webex Meetings**. If you are already registered, you do not need to register again. Otherwise, to join the seminar please send an e-mail to seminarim@ug.edu.ge or register here:

<https://forms.gle/xfQJ9fg1uqe7CrZw6>

You will then receive further information.

WEB of Seminar: <https://ug.edu.ge/en/tbilisi-analysis-and-pde-seminars>

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3. G. Tephnadze, Institute of Mathematics, University of Georgia, Tbilisi

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