

Bahçeşehir University, Istanbul, Türkiye  
Analysis & PDE Center, Ghent University, Ghent, Belgium  
Institute Mathematics & Math. Modeling, Almaty, Kazakhstan

## “Analysis and Applied Mathematics”

Weekly Online Seminar

### Seminar leaders:

Prof. Allaberen Ashyralyev (BAU, Istanbul),  
Prof. Michael Ruzhansky (UGent, Ghent),  
Prof. Makhmud Sadybekov (IMMM, Almaty)

Date: **Tuesday, January 6, 2026**

Time: 15.00-16.00 (Istanbul) = 13.00-14.00 (Ghent) = 17.00-18.00 (Almaty)

Zoom link: <https://us02web.zoom.us/j/6678270445?pwd=SFNmQUIvT0tRaHlDa-VYrN3I5bzJVQT09>, **Conference ID:** 667 827 0445, **Access code:** 1

### Speaker:

**Dr. Kübra Değerli**

*Bahçeşehir University, İstanbul, Türkiye*

Title: **Stability and Hopf bifurcation analysis for a financial dynamical model with time delay**

Abstract: In this talk, the stability and Hopf bifurcation of a fractional-order delayed financial system will be discussed. In the analysis, the Laplace transform is used after the nonlinear system is converted to a linear system. By considering the time delay  $\tau$  as the bifurcation parameter, it is shown that the equilibrium point remains asymptotically stable for all  $\tau < \tau_0$ , whereas for  $\tau > \tau_0$ , the system undergoes a Hopf bifurcation at certain critical values of the delay. Finally, all theoretical results are supported by numerical simulations using MATLAB.

### Biography:

**Kübra Değerli** received her BSc degree in Mathematics and a double major BSc degree in Statistics from Yıldız Technical University (Türkiye), and completed her MSc and PhD degrees in Mathematics at the same university, finishing her PhD in 2025. She has been a research assistant at Bahçeşehir University since 2019. Her research interests include nonlinear fractional-order differential equations, stability and bifurcation analysis, numerical methods, discrete-time dynamical systems, and mathematical biology.