

**M**ATHEMATICS  
**S**OLLOQUIUM Hosted by the  
SERIES Department of Mathematics



**Time:** Thursday, Feb. 10, 2022, 12:30-1:20pm

**Zoom Link:**

**Speaker:** Qin Sheng, Ph.D., Professor

Baylor University, Department of Mathematics, Waco, Texas

**Title:** From Derivation to Error Analysis of Splitting Methods—A Contemporary Review

**Abstract:** Splitting methods, with representative examples such as ADI (alternating-direction implicit) method and LOD (local one-dimensional) method, have been playing a significant role for the numerical solution of differential equations. In this talk, we will start from a seemed-to-be obvious issue as an introduction of the modern splitting methods. Historical roots of the literature will be mentioned. We will then use a splitting approach for solving a semi-linear Kawarada partial differential equation which is extremely important to numerical combustion, environmental protection, and biomedical research. Finally, the concept of global error and its estimates will be discussed and extended.

Students are welcomed, since this talk is suitable for all of you graduates and undergraduates.

**About the speaker:** Dr. Sheng received his Ph.D. from the University of Cambridge under the supervision of Professor Arieh Iserles. After his postdoctoral research with Professor Frank T. Smith, FRS, in University College London, he joined National University of Singapore in 1990. Since then, Dr. Sheng was on faculty of several major universities till his joining Baylor University in 2005, which is one of known research institutions in the country.

Dr. Sheng has been interested in splitting and adaptive numerical methods for solving linear and nonlinear partial differential equations. He is also known for the Sheng-Suzuki theorem in numerical analysis. He has published over 110 refereed journal articles as well as 6 joint research monographs. He has been an Editor-in-Chief of the SCI journal, International Journal of Computer Mathematics, published by Taylor and Francis since 2010. He gives invited presentations, including keynote lectures, in international conferences every year. Dr. Sheng currently advises two doctoral students.