

## Mathematical Sciences Colloquium

# On the Importance of Studying Stability for Stochastic Biochemical Systems



Professor

**Jinsu Kim**

Dept. of Mathematics, POSTECH

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Venue Building 110, Auditorium N103

Host

Prof. Chang Hyeong Lee

[chlee@unist.ac.kr](mailto:chlee@unist.ac.kr)

### Abstract

Continuous-time Markov chains are widely used to model biochemical systems when the intrinsic noise of the system plays an important role in its dynamical behavior. The stability of the stochastic models holds when the time evolution of the associated probability distribution converges to a limiting distribution. People in more practical research fields frequently undervalue the significance of stability, despite it being one of the most crucial mathematical concepts to understand. In this talk, we will go through a couple of novel computational and analytical methods for analyzing stochastic biochemical systems, and we'll look at how the systems' stability were used to invent those methods. With interesting examples, we will further discuss the importance of studying convergence rate to the limiting distribution, i.e., the rate of stabilization, which is yet another important concept but overlooked in practical research.