Ulam Colloquium 2024

Modelling intermediate filaments– from filament elongation to network organization

Dr. Stephanie Portet, University of Manitoba

Intermediate filaments (IFs) constitute a crucial component of the cytoskeleton, playing vital roles in maintaining cell shape, mechanical integrity, and providing support for cell migration and signalling. Unlike microtubules and actin filaments, intermediate filaments form a diverse family of proteins, including keratins, vimentin, desmin, and neurofilaments, expressed in a tissue-specific manner.

The organization of intermediate filaments within cells is paramount for their diverse functions. The spatio-temporal arrangement of IF networks is determined by a dynamic interplay between assembly/disassembly processes and various modes of transport within the cell. Mathematical models have proven invaluable for comprehending the intricate mechanisms governing IF behavior. This overview will present some mathematical models used to investigate key aspects of intermediate filament dynamics, such as filament assembly, transport, and network remodeling.

Monday, January 29, 2024
4:05 pm
Little Hall 101

Tea, preceding the talk, at 3:30 pm in Little Hall 339

Dr. Stephanie Portet received her PhD from Paris 7 University in 2001 and is currently a Professor in the Department of Mathematics at the University of Manitoba, Winnipeg, Canada. She is a biomathematician working in the area of cellular biology, and more specifically, cytoskeletal networks.

Stanislaw Ulam (1909-1984) was a Graduate Research Professor at the University of Florida from 1974-1984, and was one of the 20th Century's leading mathematicians. In 1998-99, under the leadership of chair Krishnaswami Alladi, the Department of Mathematics initiated the annual Ulam Colloquium Lecture Series in applied mathematics at the University of Florida.