Abstract:
The talk has two parts. In the first part, we will seek an answer to the question: What type of 2-dimensional patterns may be obtained by tiling transitions of finite two-dimensional automata assuming a specific state on each west-north-east-south border? To address the problem, we introduce a formalism using systems of recursive equations built on top of new classes of two-dimensional regular expressions. Then, we propose a research programme for getting structural characterizations for 2-dimensional languages generated by finite two-dimensional automata. We show that, enriched with spatial and temporal data attached to tiles, the formalism leads to a natural model for interactive, distributed programs. Finally, we comment on a few classes of applications: (1) lifting problems, results, and implementation packages from strings to images; (2) specification and verification of interactive, parallel, distributed programs; and (3) considering new data-types for programming languages (generalized arrays) in order to handle 2-dimensional words and their extension to other dimensions.

In the second part, I will introduce the Computer Science Department at the University of Bucharest.

Bio:
Gheorghe Stefanescu is a Professor of Computer Science and the head of the Department of Computer Science at University of Bucharest. He has extensive experience in the formal methods research area. Before joining University of Bucharest in 1995, he spent 15 years as a researcher at the Mathematical Institute of the Romanian Academy. He obtained his PhD at University of Bucharest in 1992. He held several invited scholar positions at National University of Singapore (3 years), University of Illinois at Urbana-Champaign (1 year), Kyushu University (1 semester). He was awarded the "Grigore Moisil" award of the Romanian Academy in 2000.