



**ALGEBRA SEMINAR TALK**  
**FRIDAY, JANUARY 8, 2010**



**LILA KARI**

**Canada Research Chair in Biocomputing**  
**Department of Computer Science**  
**The University of Western Ontario**

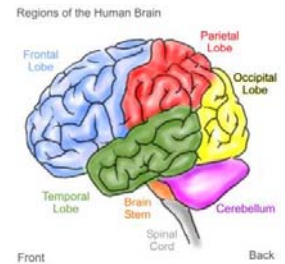
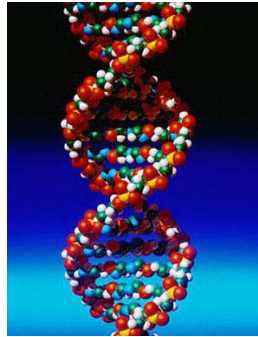
**2:30 P.M. – Middlesex College Room 108**

**“The many facets of natural computing”**

Natural computing is the field of research that investigates models and computational techniques inspired by nature and, dually, attempts to understand the world around us in terms of information processing. It is a highly interdisciplinary field that connects the natural sciences with mathematical and computational science, both at the level of information technology and at the level of fundamental research. As a matter of fact, natural computing areas and topics come in many flavours, including pure theoretical research, algorithms and software applications, as well as biology, chemistry and physics experimental laboratory research.

In this talk, we describe models and computing paradigms abstracted from natural phenomena as diverse as self-reproduction, the functioning of the brain, Darwinian evolution, group behaviour, the immune system, the characteristics of life, cell membranes, and morphogenesis. These paradigms can be implemented either on traditional electronic hardware or on alternative physical media such as biomolecular (DNA, RNA) computing, or trapped-ion quantum computing devices. Dually, we briefly describe several natural processes that can be viewed as information processing, such as gene regulatory networks, protein-protein interaction networks, biological transport networks, and gene assembly in unicellular organisms. In the same vein, we list efforts to understand biological systems by engineering semisynthetic organisms, and to understand the universe from the point of view of information processing.

The talk is based on the review article "The Many Facets of Natural Computing", L. Kari, G. Rozenberg, "Communication of the ACM", October 2008.



We count, compute, and calculate the days until Lila Kari will tell us about this fascinating topic this Friday. After this talk we shall be even better equipped to calculate Lila’s next talk with even more details related to this exciting topic. Come this Friday to M.C. 108, make yourself at home, and prepare to enter into this wonderful world of natural computing.



**ALL ARE WELCOME! ☺**