

ZERNIKE INSTITUTE COLLOQUIUM

Thursday, February 5th, 2009

16:00h, Lecture Hall: 5111.0080

Coffee and cakes from 15:30h

From Biomimetic Polymers to Cellular Cyborgs: Ordinary Steps in a Complex Journey

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A large number of tools and machineries specifically geared to the gathering, processing and transmission of molecule-based operations are controlled, in Nature and so-called “intelligent” artificial systems, at the nanometric level. The most exquisite system known in this context is most certainly the living cell, which makes a very subtle use of (supra) (macro)molecular tools to ensure the control of complex operations such as the transport and capture of matter and energy, signal regulation, chemical sensing, internal and external signaling, metabolic control as well as information storage. In order to build and operate these bottom-up processes, functional nanobricks are used that display two central

features: (1) an intrinsic or acquired ability to integrate a larger substructure at the exact location where its function will be needed, and (2) a local organization of structural elements in order to offer an effective control of specific local properties such as, for example, ion transport or molecular recognition.

In this talk, a few examples will be discussed of ongoing projects aimed at designing polymers inspired by the molecular mechanism used by Nature and capable of reaching the level of control demonstrated by biological systems. A special effort will be made to provide a broader view on the complex journey that leads from single molecules to larger assemblies.

