

MARE BALTICUM LECTURES

LIGHT INDUCED PROCESSES IN MOLECULAR SYSTEMS AND NOVEL MATERIALS

PART II – MOLECULAR DEVICES AND TAUTOMERISM

Dates:	Mo. 28.10., 4.11., Fr. 15.11., Mo. 18.11., 25.11., 2.12.; 10 c.t. till 12 o'clock
Location:	Seminar room Life, Light & Matter, Albert-Einstein-Str. 25, SR 110
Lecturer:	Prof. Liudmil Antonov, Bulgarian Academy of Sciences, Sofia
Number of participants:	about 20
Language:	Englisch
Target audience:	Master and PhD students and postdocs in Life Sciences, Chemistry and Physics



Workshop description:

The concept of molecular machines, introduced by Feringa, Stoddard and Sauvage, has led to enormous public and scientific interest about the mechanism of their action and possible tools for control. The existing single molecular motors and switches are light/electricity fuelled and operate through elementary steps like bond isomerization or bond formation/breakage. Tautomeric proton transfer, which leads to changes in the structure/properties of the organic molecules under external stimuli, is another elementary process that is exploited for molecular devices design. Currently applications like UV-protectors and functional chromic materials, useful action of some natural products and drugs, etc., are based on proton transfer, as well as also undesired processes, such as the mutagenic mispairings during DNA replication. The workshop gives an introduction to switching and device concepts, tautomerism and proton transfer as possible realization, methods for investigation and basics of practical applications.

The format is a combination of lectures and journal club. The lecturers will first give an introduction to a specific topic, then the students will read a key publication in which the presented concepts, processes, or methods are applied to problems in chemistry, biology, or medicine. These applications are then discussed in a seminar.

Topics:

- The new tricks of the old good UV-Vis spectroscopy
- Tautomerism and proton transfer: fundamentals and function of targeted molecular design
- Switches and motors: are molecular vehicles really possible
- Tautomeric switching and signalling systems