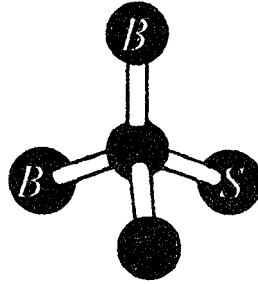




Université de Liège



The Belgian Biophysical Society

# **LIGHT, LIFE and SPECTROSCOPY**

**Summer school in Biophysics**

Botany Department, University of Liège

April 25 to May 3, 2000

Maryse HOEBEKE and Jacques AGHION

coordinating editors

## Foreword

In the absence of a clear definition of living beings, let us analyse the sequence of life-studies. Going back in time for instance by riding H.G. Wells's "Time Machine", we would probably see humanity beginning to look at living nature, animals and plants, as sources of food, fragrances, poisons, drugs ... you name it. Given the classifying bend of the human mind, taxonomy emerged rapidly from such observations. Morphological and anatomical studies, themselves followed by macroscopic physiology appeared quite naturally. Once they were accurate enough, the need for knowledge of mechanisms was felt; it implied knowledge of chemistry. Actually scientific chemistry and biochemistry emerged almost together, one at the end of the 18th century, the other in the first half of the 1800's.

Physics got its letters patent of nobility as a science with Copernicus and Galileo, it deals with accurately measured quantities and it derives abstract concepts. Chemistry became a science when it began dealing with accurate measurements (Lavoisier, Dalton, Boyle, Mendeleev and many others.). The more accurate its measurements, the closer chemistry moved to physics : look at the atomic concept by Dalton, then by Bohr and by Rutherford : where does chemistry end, where does physics begin ? Quantum mechanics drew those two sciences closer still. Just as physics and chemistry coalesce *via* the emergence of physical chemistry, the latter and biology could move together through the doors of biophysics sometimes called physical biochemistry. Nobody knows what was the magical step when chemistry and physics became biology. All we know is that it needed a lot of carbon !

Therefore biophysics is a huge field and the following series of contributions was voluntarily limited to the interactions of light and living matter and to their spectroscopic studies. Why limit ourselves to spectroscopy ? That it is very widely used in all fields of biochemical studies seemed a good enough reason. Why then only the effects of light ?

Our mother planet, Earth with its atmosphere, is an enclosed space. Few things escape from it and almost nothing reaches it from outer space except sunlight (cosmic rays are neglected here as well as interspace rockets or any problematic extraterrestrial unidentified flying objects). The use of light by green plants and algae is at the source of exactly all organic (and bio-) chemistry on Earth, of all energy existing at our level. Light allows us to grasp our surroundings with some accuracy, light regulates the living rhythms of plants and animals, it regulates the growth and the sexualisation of plants : light is indeed a gift from outside, it is the only gift. It was felt by the organizers of this small meeting that light deserved to be honoured. The authors of the different contributions were chosen as the best people to honour this gift, each with his or her own idiosyncrasies.

Maryse HOEBEKE

Jacques AGHION

**Biophysics Summer-School - Time-Table - 25 April → 03 May 2000 - University of Liège (Belgium)**

Hours / Dates	Tues 25 April	Wednes 26 April	Thurs 27 April	Fri 28 April	Tues 02 May	Wednes 03 May
0900 - 1200	Registration	M. Hoebeke	A. Laisk	M.-P. Fontaine-Aupart	R. Valcke	POSTERS
1400 - 1700	J. Aghion	A. Laisk	M.-P. Fontaine-Aupart	R. Valcke	Y. Engelborghs	POSTERS
<b>Evenings</b>						

**Lecturers**

Jacques Aghion (U of Liège, B) - Introduction. Light-matter interactions  
 Yves Engelborghs (KU of Leuven, B) - Time-resolved fluorescence of proteins : what can we learn ?  
 Marie-Pierre Fontaine-Aupart & F. Tifibel (U of Paris-Sud, F) - Time-resolved spectroscopy (fluorescence, absorbance) in the study of biological molecules  
 Maryse Hoebeke (U of Liège, B) - ESR associated to spin-label methods in the study of photosensitization in liposomal solutions  
 Agu Laisk (U of Tartu, EE) - Chlorophyll a fluorescence and 800 nm absorbance changes as tools for probing leaf photosynthesis  
 Roland Valcke (U of Limburg, B) - Regulation of the pigment-protein complexes by light. Molecular coordination between nuclear and plastid genomes

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