

# Spring School on Solar Energy and Photosynthesis

## 23 September 2019

### Public Lecture

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You are cordially invited to a lecture presented by



**Prof. Artur Osyczka**

Department of Molecular Biophysics  
Faculty of Biochemistry, Biophysics and Biotechnology  
Jagiellonian University  
Kraków, Poland

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**Date:** Monday, 23 September 2019  
**Time:** 17:30 – 19:00  
**Venue:** Sci-Enza, University of Pretoria  
**Enquiries:** Prof. Tjaart Krüger, [tjaart.kruger@up.ac.za](mailto:tjaart.kruger@up.ac.za)

### **The fascinating world of light-driven molecular machines**

Plants use light energy to convert carbon monoxide into sugars and other chemical compounds that build organisms on earth. This process, called photosynthesis, is not only a crucial energy conserving process, but also a main source of oxygen, which both contribute enormously to support life on earth. Photosynthesis takes place in assemblies of very complex molecular machines that in a controlled manner capture light and use its energy to transfer electrons between different compartments of the cells to store energy in a biologically useful form. Scientists, fascinated by precision and efficiency of these molecular “factories”, intensely work to find out how they work at molecular level. In this context, the main focus of this lecture will be to provide an overview of what is known and remains unknown about the mechanisms of action of the molecular machines of photosynthesis. This knowledge provides not only fundamentals for developing basic science, but also possibilities for applications in various areas such as nanotechnology, biotechnology and agriculture.

## More About Prof. Osyczka

Prof. Artur Osyczka is full professor and Head of the Department of Molecular Biophysics at the Jagiellonian University in Kraków. His interest in natural engineering of bioenergetic systems dates back to his graduate studies. He received a PhD from Tokyo Metropolitan University with his dissertation on bacterial electron transfer systems. His post-doctoral work, done at the University of Pennsylvania with Prof. P. Leslie Dutton, focused on the molecular mechanism of energy conversion in cytochrome *bc*<sub>1</sub>. In 2006 he was awarded an International Senior Research Fellowship by the Wellcome Trust and moved back to Kraków to establish the Laboratory of Molecular Bioenergetics. His research aims at understanding the molecular mechanisms of operation of energy conserving systems from the physicochemical point of view and also in relation to cellular physiology. He focuses on enzymatic catalysis/regulation and electron/proton transfers in quinol oxidoreductases and on dynamics of protein-protein interactions in redox systems. The experimental approach combines molecular biology, biochemical and biophysical methods with an emphasis on time-resolved optical and electron paramagnetic resonance spectroscopy. He has authored more than 60 papers, including publications in *Nature*, *Science*, *PNAS*, *Physiol. Rev.* and *TiBS*.