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PRESENTED BY THE
WATERLOO INSTITUTE FOR SUSTAINABLE ENERGY

Thursday, May 22, 2014
1:30 pm – 2:30 pm
CPH 4333

MICROALGAE FOR ENERGY PRODUCTION: BETWEEN DREAM AND REALITY

Dr. Eric Prouzet, *Associate Professor, Department of Chemistry*

Energy is everywhere in our daily life, however fossil resources are limited and therefore to conserve these resources and obtain a more sustainable way of life, there needs to be a smooth transition. For example, our fossil fuel-based production of energy consumes carbon-based molecules and releases carbon dioxide.

Carbon dioxide contains the same carbon backbone as the organic molecules used as a fuel. If we could turn carbon dioxide (CO_2) back into methane (CH_4) or another alkane (C_nH_m), this would be a smart way to close the loop and develop more cyclical processes. This is a major challenge because CO_2 is like a hyper-rusted carbon, which is very stable, which does not turn back into carbon without a huge energetic or chemical push.

Many trials to chemically turn CO_2 back are expensive, less efficient, or hardly scalable. Effective mechanisms such as the natural photosynthesis and unicellular microalgae are the most effective microbiofactories that can be used for this process. In addition, microalgae can deliver the highest proportion of oil, a precursor of liquid fuels like diesel or jet-fuel. However, there are many issues to convert a natural biological mechanism into an industrial process, which will be addressed during this lecture, along with the optimized design of a specific photobioreactor addressing both biological and industrial requirements.

BIOGRAPHY

Dr. Eric Prouzet

Dr. Eric Prouzet received his undergraduate diploma in Chemistry from the *University of Nantes*, France in 1984, and an engineer's diploma from the National School of Industrial Ceramics of Limoges in 1986. Eric received his PhD in Material Chemistry at the *University of Nantes* (1988), where he worked in material chemistry for energy, electrochromism, and separation. In 1998 he was tenured at the *University of Montpellier*. He is currently a Senior Scientist at the French National Research Agency (C.N.R.S.) and an Associate Professor in the Department of Chemistry (Nanotechnology and Inorganic Chemistry) at the *University of Waterloo*.

Eric is the co-founder and former CSO of Prodal-G Inc., a company dedicated to developing technology that produces valuable renewable oils.

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