SEMINARIUM Z MAGNETYZMU I NADPRZEWODNICTWA

Uprzejmie zawiadamiamy, że w **CZWARTEK**

24 lipca 2014 r., o godz. 10:00

w sali 203 (bud. 1) odbędzie się seminarium, na którym

Prof. dr Bartłomiej A. Głowacki

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wygłosi referat na temat:

Hydrogen cryomagnetics: synergies between superconductivity and the hydrogen economy

Currently the global production of hydrogen is mainly for industrial uses. However the production of hydrogen for alternative uses is anticipated to increase. For example compressed and liquid hydrogen can be used as both an energy storage medium and as an energy carrier. Liquid hydrogen has important additional potential as a cryogenic coolant. “Hydrogen cryomagnetics” is an enabling technology for superconductivity. In our presentation we will discuss the use of cryogenic hydrogen originated from renewable and low-CO_2 emission sources. We suggest that 20K liquid hydrogen can ultimately displace liquid helium as a coolant in a range of superconducting electromagnetic devices; such as novel engineering designs made possible through the use of medium-temperature MgB_2 superconductors.

As the world moves towards a low carbon economy the production of hydrogen from low carbon technologies will be important. Methane plasma reforming is an essentially emission-free method of hydrogen production producing both hydrogen and valuable carbon nano-forms. The hydrogen industry can grow in harmony with the carbon nanotechnology industry. The wind energy industry is seeing strong growth globally. It is another potential low carbon source of hydrogen production. An interesting hydrogen cryomagnetic application could be to use 20K hydrogen-cooled superconducting homopolar generators in combination with the advanced electrolysis of water and hydrogen liquefaction.

Our research makes use of system dynamics to model potential liquid hydrogen futures including hydrogen cryomagnetics innovations. It will help identify the stocks and flows of hydrogen (both liquid and gaseous) in a range of future scenarios including some that differ greatly from established scenarios that give emphasis to fuel cell vehicles as the dominate technology driver of a future hydrogen economy.. Hydrogen’s use as a coolant, as well as an energy carrier, will spin-off new research and technological developments in superconducting materials and efficient energy use greatly increasing the scale of superconductivity applications in areas such as: MRI, SMES, Flywheel, and DC cables for data centres.

Serdecznie zapraszamy

Roman Puźniak
Henryk Szymczak
Andrzej Wiśniewski