Physics
AT QUEENS COLLEGE

Colloquium Notice

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Using diatoms as a platform for renewable energy

Despite the fact that there are still abundant natural petroleum reserves (supplies will last for more than a century), significant carbon mitigation cannot be achieved without the development of environmentally sustainable and renewable fuels. Owing to their high productivity-to-biomass ratio, ease of cultivation, and ability to grow in saline water, algae have been considered as a leading biodiesel feedstock. To displace fossil fuels, however, algae must be grown at a scale that yields approximately 10 million barrels of oil per day – which would supply approximately 50% of the total U.S. consumption. For the last few decades, researchers have searched for the "sweet spot" between algae's triacylglycerols (TAG) production and biomass accumulation to obtain a strain with increased lipid production that can be developed as a commercially viable algal feedstock for biofuel production. Diatoms, a unique algal taxon, naturally accumulate TAGs as storage components, which can be readily converted to biodiesel. In fact, lipids derived from fossil diatoms are a major component of the highest quality petroleum. Therefore fast growing, lipid accumulating, diatoms can be an excellent platform for biodiesel production. For many years, studies have been performed to environmentally optimize diatoms' lipid production and biomass accumulation, yet no economically sustainable strain has been reported. In my talk, I will present our unique, genetically modifies, strains generated from the model diatom *Phaeodactylum tricornutum*, that could be used as a test-case for economical sustainable biofuel production. These strains are characterized by high lipid yield, yet keep relatively fast growth rates and are more efficient in using solar energy for lipid production.

Monday
November 7, 2016
Starts at 12:15 PM
Coffee at 12:00 PM
Physics Conference Room, SB B326