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16th JEREMY GRANTHAM LECTURE ON CLIMATE CHANGE

Title: "Towards a universal theory of plant and ecosystem function"

Speaker: Prof. Iain Colin Prentice, Chair, Biosphere and Climate Impacts, Imperial College, London

Date: 26 November 2020 (Thursday)

Time: 3:30 PM (IST)

Venue: ONLINE using Zoom

Abstracts:

This talk will introduce a new theoretical framework to describe the core processes of plant and ecosystem function. This framework is supported by two pillars. One is the eco-evolutionary optimality principle, which invokes the power of natural selection to eliminate suboptimal traits or combinations of traits. The other is the explosive growth of data, from large compilations of field measurements traits and rates, through eddy-covariance flux measurements of carbon dioxide and energy exchanges between ecosystems and the atmosphere, to global atmospheric measurements of carbon dioxide and satellite-derived data on green vegetation cover. Tremendous opportunities now lie in formulating specific, pragmatic optimality hypotheses, and finding ways to use combinations of data types to test them. I will show some of the recent successes of this approach in developing new formulations for photosynthetic capacity, stomatal function, and leaf economics at the leaf scale; carbon dioxide exchange and transpiration at the ecosystem scale; and terrestrial carbon uptake at the global scale. Common to all these formulations are that (a) they are remarkably simple (although their functional forms would never be identified by statistical analysis alone); (b) they are universal, not requiring distinct parameters for different plant functional types except for the necessary distinctions among the three main photosynthetic pathways; and (c) they explain as much, or more, variance in observations than existing alternatives, despite depending on far fewer parameters.

ALL ARE WELCOME