

Colloquium

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Wednesday, January 7, 2015
2:00pm, HH 3026

Identifying and characterizing permutation patterns in spiral phyllotaxis

Abstract:

Like many other plants, *Arabidopsis Thaliana* has its organs arranged as a spiral along the stem, with each organ forming a fixed angle - the golden angle - with its predecessor. This organisation, called spiral phyllotaxis, actually presents some disturbances in real plants. In particular, systematic measurements have shown that the series of angles between organs present some "accidents", taking the form of series of angles differing from the golden angle. After describing the main mechanisms known to underlie spiral phyllotaxis, this presentation will present a combinatorial model of the observed disturbances, based on the assumption that they result from permutations of successive organs. We also present identification algorithms, which were used with the experimentally measured angles. Together with a statistical approach relying on hidden Markov chains, this work allowed to confirm with great certainty that the observed perturbations were the result of organ permutations. Joint work with : F. Besnard, C. Godin, Y. Guédon, Y. Refahi, T. Vernoux.