



SEMINAR

APPLIED MATHEMATICS AND MECHANICS

FS974

17 August 2022

A DCAMM seminar No. 756 will be presented by

Professor C.J. Chapman
Keele University, United Kingdom

The title of the lecture is

Fractional power series and the method of dominant balances

Abstract:

This talk describes a general treatment of the method of dominant balances for a polynomial equation, in which parameters are to be scaled in such a way that the maximum possible number of terms in the equation is in balance at leading order. This leads in general to a fractional power series (a 'Puiseux series'), in which, surprisingly, there can be large and irregular gaps (lacunae) in the fractional powers actually occurring. A complete theory is given to determine the gaps, requiring the notion of a Frobenius set from number theory, and its complement, a Sylvester set. The talk is applied in outlook, as the method of dominant balances is widely used in physics and engineering, where it gives results of extraordinary accuracy, far beyond the expected range. The work has been conducted in a collaboration begun at the Isaac Newton Institute, Cambridge, with H. P. Wynn (London School of Economics). We believe the results are new. Despite hundreds of years of use of Puiseux series (since 1676), we are not aware of any previous attempt to give a complete quantitative account of their gaps.

DATE:	Tuesday, 30 August 2022
TIME:	14:00 – 14:45
PLACE:	Auditorium B – 5.034 Aalborg University, Dept. of Mathematical Sciences, Skjernvej 4A

Danish pastry, coffee and tea will be served 15 minutes before the seminar starts.

All interested persons are invited.

Niels Leergaard Pedersen

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