

**ON LIE-BUTCHER THEORY AND POST-LIE
ALGEBRAS; AN INTRODUCTION TO ALGEBRAIC
COMBINATORICS OF FLOWS**

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B-series, named after John Butcher's seminal work in the 1960s, is an indispensable tool in analysis of numerical algorithms for integration of differential equations. In recent years there have been many new developments in the algebraic understanding of such series. In particular analysis of structure preserving algorithms and flows on manifolds and Lie groups have yielded new insights. Lie-Butcher theory is a unification of Lie series and B-series used for analysing flows on manifolds. We will in this talk give an overview of the field and survey recent results.

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