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A Talk at the 2nd ISNMP Conference

Bad Ems, 28 June to 4 July 2026

Open Problems Session:

Speaker: Ralph Willox (University of Tokyo, Japan)

Title: *On some crucial (but potentially difficult...) open problems to do with higher order birational mappings*

Abstract: During the **Open Problems Session**, I will explain the precise mathematical context in which the following open problems concerning higher order birational mappings arise:

- Can one construct examples of *non-autonomous* higher order *integrable* maps with coefficients that contain multiple exponential functions (of the variable n that counts the number of iterates), and not just two as in the case of the Lyness mapping (the subject of my lecture; see also *arXiv:2603.24871 [nlin.SI]*)?
- Do there exist higher order birational mappings (not necessarily integrable) which have a non-autonomous extension that preserves their dynamical degree, but for which that non-autonomous version cannot be obtained solely based on the singularity structure of the mapping (cf. *arXiv:2602.04147 [nlin.SI]*)
- Does there exist an example of a *non-integrable* birational map which has a non-autonomous extension that preserves its dynamical degree but that contains coefficients the asymptotic behaviour of which does not reflect that dynamical degree (cf. *arXiv:2306.01372 [nlin.SI]*)?