

NITheCS Mini-school
Wednesday 7, 14, 21 & 28 September 2022, 14h00 – 15h00
Dr Henri Laurie (previously from the University of Cape Town)

'The Julia language: easy, generic, fast (but no free lunch)'

ABSTRACT



These four talks on Julia form a general and high-level introduction to Julia as a language for scientific computing.

Talk 1: A showcase of Julia code, development interfaces and achievements, and introducing the claims that Julia solves the two-language problem, and also solves the expression problem.

Talk 2: Julia's design principles and tradeoffs (covering things like multiple dispatch, the type system, the object model, modularity, scope rules, JIT compilation, code introspection, parallelisation by design, and perhaps others).

Talk 3: The DifferentialEquations organisation (which claims to be by far the best general-purpose system of packages for differential equations).

Talk 4: Rapid development of performant code, massive code re-use: does Julia really solve the two-language problem and the expression problem? And what might this mean for HPC?

BIOGRAPHY

I'm an applied mathematician who has retired from UCT.

My first degree was in the arts, from which I retain an interest in philosophy and the perspective that computer programming is applied formal logic.

Via teaching I landed up in academia (UCT PhD 1994 in population dynamics). I turned to Julia when Octave and Python were just too slow for a modelling project.

I have been teaching Julia for several years at [AIMS South Africa](#). The course is on solving ODEs using the metapackage `DifferentialEquations.jl`.

I have also developed two introductory online courses, namely:

- ['Julia Scientific Programming'](#) on Coursera
- ['Julia Programming for Nervous Beginners'](#) on Julia Academy.

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