



Computational Mathematics: What is it? What is it good for?

Prof Jan Nordström

(Linköping University, Sweden; & University of Johannesburg)

Monday, 9 November 2026 | 16h00–17h00 SAST

HOW TO ATTEND:

In person (main venue):

- Road House Cinema
(Neelsie)
Stellenbosch University

Watch at satellite venues:

- MITP Boardroom P215,
2nd Floor Physics Building
University of the Witwatersrand
- Seminar Room K310
Physics Building G5
North-West University

Online (live stream)

--- Please note, a recording of the lecture will be published on the NITheCS YouTube channel following the event ---

ABSTRACT

We introduce Computational Mathematics as a scientific discipline and exemplify its practicality. Next, we present the linear theory for achieving high order accurate and stable solutions to initial boundary value problems (IBVPs). The theory is based on the combination of summation-by-parts operators (SBP) and weak boundary conditions (SAT). We show how to extend the SBP-SAT technique to nonlinear IBVPs and conclude with recent applications.

BIOGRAPHY

Jan Nordström is Professor Emeritus in Computational Mathematics at Linköping University, Sweden; Distinguished Visiting Professor in the Department of Mathematics and Applied Mathematics at the University of Johannesburg; and Honorary Professor of Computational Mathematics at University of Cape Town.

He is a member of the Academy of Science of South Africa, and an associate editor of the *Journal of Computational Physics*, *BIT Numerical Mathematics* and *AIMS Mathematics*. His research focuses on initial boundary value problems (IBVPs), particularly the fundamental effect of boundary and interface conditions on well-posedness and stability. He stresses the necessity to understand IBVPs in developing numerical approximations.



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