

Conference Keynote:

Charting the development of PISO.



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Raad Issa is *Professor of Practice (Computational Fluid Dynamics)* in the Department of Mechanical Engineering, Imperial College of Science Technology and Medicine, and is renowned as the Father of the PISO Algorithm.

Dr. Issa is a significant player in the development of Commercial CFD, as a co-founder of Computational Dynamics Limited, which first adopted the unique benefits of PISO for its superior computational efficiency in transient simulations especially in IC-engine flows in the flagship code STAR-CD launched in the late 1980s. This algorithm has been widely adopted since then.

This keynote will address the motivations for the PISO (**Pressure-Implicit with Splitting of Operators**) solution methodology, its development for unstructured meshes and future perspectives and recommendations for efficient numerical applications of CFD in transient flows.

PISO has become one of the standard methods for solving the discretised fluid flow equations, and is available in OpenFOAM as well as main commercial codes. It has gained wide acceptance because of its superior speed especially for unsteady state flows. The key to its success was the realisation of the deficiency in the standard segregated methods of solution, which necessitate the use of costly iteration processes. This led to devising a structured corrector strategy that achieves temporal accuracy comparable to the temporal discretisation scheme used in advancing the solution in time. The talk will present the history and rationale behind developing it, its extension to collocated and to unstructured meshes and will outline some developments that consolidate its performance.