

## Preface

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Professor Saul Abarbanel

This issue is dedicated to Professor Saul Abarbanel on the occasion of his eightieth birthday. The unifying theme throughout Saul Abarbanel's distinguished career in computational fluid dynamics has been the importance of the triad of theory, computation, and applications. The papers in this issue reflect the interplay between these three elements and so are a fitting tribute to Saul.

Saul Abarbanel started his education in Aeronautical Engineering at MIT in the 1950's, and received his doctorate from MIT in 1959 Theoretical Aerodynamics with a minor in

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Physics and Mathematics. His career included faculty positions at MIT and Tel Aviv University, as well as the position of IBM Distinguished Visiting Research Professor at Brown University. In the 1960's and 1970's he held influential positions in the administration of Tel Aviv University, including serving as Rector of the University from 1977 to 1980.

These important administrative responsibilities did not prevent him from developing his scientific activity at the highest level. Saul was among the first pioneers to realize the potential of applying computational methods to advance the knowledge in aeronautical and space engineering. His own work as well as his scientific leadership contributed to the integration of advanced numerical techniques in the sciences. In particular, Saul was among the first computational scientists to promote the use of high order numerical methods for computing solutions of partial differential equations used in aerodynamics. Saul has also made breakthroughs in the theory and implementation of numerical boundary conditions. In more recent years he made significant contribution to the field of absorbing boundary conditions. His own research, as well as the research that followed it, made Israel (and Tel Aviv University in particular) a world class center in scientific computing.

Saul introduced computational mathematics at Tel Aviv University and educated generations of students, including doctoral students who also went on to become internationally renowned. Saul's influence extended far beyond Tel Aviv University: he spent many years as a consultant at NASA's Institute of Computer Applications to Science and Engineering (ICASE), and served as Chair of the Council of Institutions of the Universities Space Research Association (USRA), and as Chair of the Applied Mathematics Committee in the European Mathematical Society. The appointments were all due to his internationally recognized leadership role.

Most of the papers in this special issue were presented at an international conference on advances in the analysis and numerical analysis of partial differential equations at Tel Aviv University in June 2011 that was organized in honor of Saul's eightieth birthday by his colleagues and students. This conference was funded by the European Office of Aerospace Research and Development (Air Force Office of Scientific Research, United States Air Force Research Laboratory) and Tel Aviv University, and featured twenty two international speakers. This conference was a reflection of the high esteem in which Saul is held in the international scientific computing community.