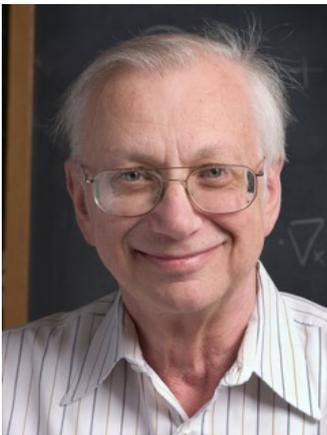


Preface

Special volume in honor of Professor David Gottlieb

In this special volume we pay a modest tribute to the scientific legacy of David Gottlieb who passed away in December 2008. Among his many contributions to the Applied Mathematics community, David served M2AN as an Associate Editor for many years, and his breath and unique insights have been invaluable for the success of the journal.



Born in Tel-Aviv, Israel, in 1944, David earned his Ph.D. in 1972 under the guidance of Professor Saul Abarbanel as the first Ph.D. in Mathematics from the University of Tel-Aviv. After a post-doctoral appointment at MIT, he returned to Tel-Aviv University where he eventually served as the Chairman of the Department of Applied Mathematics during 1983–1985. David joined Brown University in 1985 where he remained for the rest of his career, and served as the Chair of its Division of Applied Mathematics during 1996–1999. Among many distinctions, his achievements were recognized by honorary degrees from University of Paris VI and Uppsala University, and by his election to the US National Academy of Sciences in 2006.

David had a unique ability to inspire people around him as he was generously sharing his ideas and insights with students and collaborators. He developed a broad range of research interests in Applied Mathematics. Accordingly, the present volume reflects a diversity of contributions from students, collaborators, and friends of David.

In the paper by Chertock, Du Toit, and Marsden, the authors develop particle methods the EPDiff equation, known to be challenging due to the complexity of the solutions and interacting waveforms. The paper by Chorin and Tu introduces a novel approach for the particle filter problem, originating in stochastic problems. The paper by Chen and Hagstrom develops high-order adaptive finite difference techniques based on Hermite interpolation methods. The paper by Kreiss, Ortiz, and Petersson lays the foundation for a complete theory for the analysis and approximation of initial boundary value problems of second-order form. The contribution by Buffa, Maday, Patera, Prud'homme, and Turinci offers an *a priori* analysis of the accuracy of greedy approximations in the context of reduced basis methods. The paper by Powell, Tanner, Wang, and Yilmaz investigates quantization by the Sigma-Delta based on random interleaved sampling. The paper by Chen, Shiue, Temam, and Tribbia develops nonlocal boundary conditions for the primitive inviscid 3D equations, including attention to how such conditions are enforced in a stable manner. The paper by Erlangga and Turkel discusses efficient iterative methods for the solution of the discrete Helmholtz equation of wave propagation. A final paper by Mishra and Tadmor introduces a new family of constraint preserving discretization techniques for the equations of Magnetohydrodynamics.

David had a considerable impact on many who have been working in this field. Although his body failed him at the end, his spirit remained strong all along and remained an inspiration to all around him.

Jan S Hesthaven, Providence, 2011
Eitan Tadmor, College Park, 2011