DISCRETE AND CONTINUOUS
DYNAMICAL SYSTEMS
Volume **34**, Number **3**, March **2014**

doi:10.3934/dcds.2014.34.3i

pp. **i–ii**

GUEST EDITORS' PREFACE

Arieh Iserles was born in Poland, on September 2, 1947. He was educated in Israel, where he received BSc and MSc degrees from the Hebrew University and obtained his PhD degree under the supervision of Giacomo Della Riccia at Ben Gurion University with the dissertation *Numerical Solution of Stiff Differential Equations* (1978). He first arrived in Cambridge, in 1978 and has remained there ever since. He has successively been Junior and Senior Research Fellow at King's College, and Lecturer (1987) and Professor (1999) at Cambridge University where he holds a chair in Numerical Analysis and Differential Equations. Arieh has received many honours, in particuluar the Lars Onsager Medal (1999) from the Nowegian University of Science and Technology and the David G. Crighton Medal (2012) from the London Mathematical Society and the Institute of Mathematics and its Applications. He holds Honorary Professorships at Huazhong University of Science and Technology, Wuhan, since 2002 and Jilin University, Changchun, since 2004.

Arieh has been a pioneer in relating numerical analysis to dynamical systems, an approach that has meant a revolution in the modern understanding of numerical differential equations. It is therefore very appropriate to dedicate to him this special issue of *Discrete and Continuous Dynamical Systems*. Some of the papers were presented at the "Meeting in Numerical Analysis", Lom (Norway), August 31–September 1, 2012, on the occasion of Arieh's 65th birthday. The contributions by Chen and Olver, Cucker and Dong, Law, Shukla and Stuart, Modin and Verdier, Pugh and Shub are all related to Arieh's impact on differential equations and dynamical systems.

The idea of analyzing numerical integrators by viewing them as discrete dynamical systems is at the basis of geometric integration, a field whose vitality after twenty-five years of intense research is shown here by the papers by Celledoni and Owren, McLachlan and Quispel, Moan and Niesen, Norton and Quispel, Wang and Hong, and Xue and Zanna. Arieh's role in the establishment and consolidation of this field cannot be overestimated.

Highly oscillatory problems, so important in many applications, pose a tremendous challenge to numerical methods. The relevant techniques are closely intertwined with those of geometric integration and it is no surprise that Arieh's relevant contributions in this area have been manifold. The papers by Asheim, Deaño, Huybrechs and Wang, Brunner, Lee and Engquist address different topics within the highly oscillatory scenario. Also related to the development of geometric integration is the current interest in splitting techniques as those used here by Calatroni, Düring and Schönlieb.

A distinctive feature of Arieh's work is its solid grounding in function theory, the theory of special functions and approximation theory. He has contributed substantially to those fields, represented in this issue by the papers by Kels and Dyn and Shadrin, and furthermore many of his publications on numerical analysis have a marked function theoretically flavor. That approach is represented in this issue by the paper by Nørsett and Asheim. Another of Arieh's distinctive traits is his

gift for working effortlessly with expansions of different kinds, as those considered in the articles by Bartha and Munthe-Kaas, Casas and Chiralt, and Ebrahimi-Fard and Manchon.

Arieh has always had an enormous devotion to the world of numerical analysis in the widest sense. An always lively participant in conferences, he has given us freely his time and effort as an organizer and as an editor. We wish to mention in particular his leadership in launching and running Acta Numerica, at present the top-cited journal in MathSciNet; his fundamental role in establishing Foundations of Computational Mathematics, an international nonprofit organization that supports and promotes research at the interface of mathematics and computation; and the establishment of the Cambridge Centre for Analysis, which he currently directs and offers a worldwide acclaimed doctoral program.

Those who have met Arieh know he is always positive and enthusiastic, especially when it comes to new ideas. He loves brainstorming in front of his whiteboard and will tell you of his recentmost discovery, often just days, even hours, old, that beats everything he has ever done. He has a warm and generous personality and is strongly supportive of young research students. Arieh's doors at work or at home are open permanently; Arieh's family, specially his wife Dganit, are always supportive. Once a friend of Arieh's, which implies accepting his matter-of-factly having a strong opinion about just everything, always a friend of Arieh's!

The authors of this preface have met Arieh when they were at different stages of their careers, be it as a postdoc, as a colleague or as a PhD student; they are privileged to be his friends. They could share many relevant anecdotes and know (almost all) the jokes that he enjoys telling at any suitable occasion. On behalf of a community that admires Arieh as a mathematician and as an individual, they wish to present him with this collection of papers that reflect, though only in part, his recent research interests.

Happy 65th Birthday, Arieh!

Guest Editors:
Elena Celledoni
Jesus M. Sanz-Serna
Antonella Zanna