

Ami Harten – An Appreciation

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Prof. Amiram Harten, Ami to his friends, was a distinguished and well-known applied mathematician, born in 1946 in Rome, Italy. His parents were DP's (displaced persons) created by WWII, on their way to Israel to carve a new life for themselves. Ami did not “fall” into mathematics. His choice was deliberate. The title of his masters thesis at Tel-Aviv University (“New Numerical Methods for Shock Calculations”) was already an indication of his major scientific concentration. Ami went to the Courant Institute of Mathematical Sciences at NYU in 1971 to pursue his doctoral studies under Peter Lax. He received his Ph.D. in 1974. From that point on, Ami became one of the important expositors and unravelers of the beauty and complex structures of nonlinear hyperbolic conservation laws, and in particular as they pertain to the numerical integration of compressible, shocked, inviscid, aerodynamical flows.

After several papers (with different co-authors) on numerical switches, hybrid schemes, and artificial compression methods as applied to shock wave calculations, came a series of seminal works starting with his paper on the “Symmetric Form of Systems of Conservation Laws with Entropy”, (JCP, 1983, ICASE report 81-34, 1981). This led naturally (except that it took Ami's insight to make it seem so natural) to the concepts of Total-Variation-Stable Schemes (1982) and Total-Variation-Diminishing (TVD) schemes (1983). TVD schemes are now recognized as the prototypical way to compute the weak-solutions of systems of hyperbolic nonlinear conservation laws. In order to deal with non-compressive discontinuities, Ami (and several co-workers) developed the ENO (Essentially Non-Oscillatory) schemes (1985 and on). In the past few years, Ami recognized that the ideas of sub-cell resolution, multi-scale resolution, and data compression cut across disciplines, and he was in the midst of an effort to try to unify the wavelet description of, and the multiresolution approach to, data compression.

A testimony to the impact of his work on the scientific and mathematical communities is the fact that he gave the invited lecture in the applied mathematics section of the International Congress of Mathematicians in Kyoto, Japan (1990).

Ami was a good and generous friend to many of us at ICASE, as in many other outstanding centers of research around the world. He was a professor of Applied Mathematics at Tel-Aviv University where he will be sorely missed by his colleagues and students. His cheerfulness and outgoing personality enlivened the atmosphere wherever he visited. We at ICASE (and at NASA Langley Research Center) will miss his ingenuity, his willingness to teach, his sparkling insights, and his generous spirit. The numerical analysis community has suffered a loss from which it will be hard to recover. We shall always remember Ami Harten and cherish this memory.