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DAVID P. HARRINGTON

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Nonlinear analysis on manifolds. Monge-Ampère equations, by Thierry Aubin, Grundlehren der mathematischen Wissenschaften, vol. 252, Springer-Verlag, Berlin and New York, 1982, xii + 302 pp., $29.50. ISBN 0-3879-0704-1

No one is very surprised if an area of mathematics can solve its own problems. The surprise is when one area of mathematics can help solve those of another. In recent years it has been our good fortune to see problems from places like algebraic geometry and differential topology solved using nonlinear partial differential equations. Of course, an area should not be judged solely on how it helps other branches of mathematics—but the publicity sure helps convince the skeptical of its current relevance. With this in mind, it is important to note that these developments have taken place as part of a vigorous general advance in our understanding of nonlinear partial differential equations.

Linear problems dominated analysis in the first half of this century, which saw the emergence of the now classical linear functional analysis of Hilbert and Banach spaces. A major source of motivation for this work came from an attempt to understand the wave, Laplace, heat, and Schrödinger partial differential equations of mathematical physics. The development of Fourier analysis was one of the most fruitful discoveries, serving simultaneously as both a tool and as a subject in its own right. Now many of the linear differential equations are linear for a very simple reason: one takes a nonlinear equation and bluntly linearizes it (see any derivation of the wave equation