

PREFACE

This special issue of *Methods and Applications of Analysis* is dedicated to Professor John Urbas on the occasion of his sixtieth birthday.

John Urbas is a leading international researcher in the Monge-Ampère equation and its associated mathematics, spanning nonlinear PDEs, differential geometry, convex analysis and measure theory. In his early work on Gauss curvature he found necessary and sufficient conditions for a domain to support a convex graph of prescribed Gauss curvature and showed that such graphs with smooth curvature must be smooth manifolds with boundary, thereby providing the Gauss curvature analogues of famous results in the theory of minimal surfaces and geometric measure theory. He also solved the Neumann problem for Monge-Ampère type equations in collaboration with P.-L. Lions and N. S. Trudinger. This was followed by a series of papers on oblique boundary value problems culminating in the proof of global regularity for the natural (or second) boundary value problem for the Monge-Ampère equation. An immediate consequence of this result, also obtained independently by Caffarelli, was the global regularity of optimal mappings for quadratic costs in the optimal transportation problem and John's subsequent Bonn lecture notes in 1998 became a standard reference in optimal mass transfer. Other major research contributions of John Urbas involved the regularity of Hessian and curvature equations and the spherical behaviour of outwards curvature flows. He is also particularly known for his expository skills and the resultant clear presentations of highly technical geometric calculations.

We are very grateful to all the authors who have contributed impressive research articles to this issue in recognition of the invaluable contribution that Professor John Urbas has made to mathematics. On behalf of all the authors we would like to express our deepest friendship and respect to Professor John Urbas and to wish him many more healthy and productive years ahead.

Guest Editors:

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