Proceedings of the

CENTRE FOR MATHEMATICAL ANALYSIS

AUSTRALIAN NATIONAL UNIVERSITY

Volume 10, 1985

Miniconference on Geometry and Partial Differential Equations (Canberra, August 1-3, 1985)

Edited by Leon Simon and Neil S. Trudinger



PROCEEDINGS

OF THE

CENTRE FOR MATHEMATICAL ANALYSIS

AUSTRALIAN NATIONAL UNIVERSITY

VOLUME 10, 1985

MINICONFERENCE ON

GEOMETRY AND PARTIAL DIFFERENTIAL EQUATIONS

(Canberra, August 1-3, 1985)

Edited

by

Leon Simon and Neil S. Trudinger

First published in Australia 1986

Centre for Mathematical Analysis, Australian National University

This book is copyright. Apart from any fair dealing for the purpose of private study, research, criticism, or review as permitted under the Copyright Act, no part may be reproduced by any process without written permission. Inquiries should be made to the publisher.

National Library of Australia Cataloguing-in-Publication entry

Miniconference on Geometry and Partial Differential Equations (1985: Canberra, A.C.T.). Miniconference on Geometry and Partial Differential Equations, Canberra, August 1-3 1985.

Includes index ISBN 0 86784 511 2.

 Differential equations, Partial - Congresses. 2.
Geometry, Differential - Congresses. I. Simon, L.M. (Leon Melvyn), 1945- . II. Trudinger, Neil S. (Neil Sidney), 1942- . III. Australian National University.
Centre for Mathematical Analysis. IV. Title. (Series: Proceedings of the Centre for Mathematical Analysis, Australian National University; no.10).

515.3'53

PREFACE

This volume contains the proceedings of a miniconference on geometry and partial differential equations held at the Australian National University in August, 1985.

We gratefully acknowledge the support of the contributors to this volume, as well as the superb organizational assistance of our secretary, Marilyn Gray, the excellent typing of Dorothy Nash, Norma Chin and Joyce Heinz and the editing assistance of David Cullen and Marty Ross.

Leon Simon, Neil S. Trudinger (Editors)

CONTENTS

Page

	TIC BEHAVIOUR NEAR ISOLATED SINGULAR POINTS METRIC VARIATIONAL PROBLEMS	
	David Adams and Leon Simon	1
THE GAUS	SS MAP OF A SUBMERSION Paul Baird	8
REMARKS	ON MULTIPLE SOLUTIONS OF NONLINEAR EQUATIONS E.N. Dancer	25
ABOUT SO	OME ILL-POSED PROBLEMS E. Di Benedetto	32
PARTIAL	REGULARITY FOR SOLUTIONS OF VARIATIONAL PROBLEMS N. Fusco and J.E. Hutchinson	57
DEGREE	THEORY AND GAUSSIAN MEASURES IN INFINITE DIMENSIONS E. Getzler	68
MINIMAL	SURFACES WITH FREE BOUNDARIES S. Hildebrandt	78
MINIMAL	SURFACE DESCRIPTION OF CRYSTAL STRUCTURES S.T. Hyde and Sten Andersson	89
A PIECEN 3-MANIF(VISE LINEAR THEORY OF MINIMAL SURFACES IN DLDS	
	William Jaco and J.H. Rubinstein	99
	Y REGULARITY FOR SOLUTIONS OF QUASI-LINEAR C EQUATIONS	·
	Chi-ping Lau	111
DEFORMI	NG RIEMANNIAN METRICS ON THE 2-SPHERE	100
	P.R.A. Leviton and J.H. Rubinstein	123
	Y BEHAVIOR OF SOLUTIONS OF ELLIPTIC EQUATIONS " DOMAINS	
	Gary M. Lieberman	128
THE NEU	MANN PROBLEM FOR EQUATIONS OF MONGE-AMPÈRE TYPE PL. Lions, N.S. Trudinger and J.I.E. Urbas	135

	Page		
WHEN ARE SINGULAR INTEGRAL OPERATORS BOUNDED? Alan McIntosh	141		
THE TOPOLOGY OF ASYMPTOTICALLY EUCLIDEAN STATIC PERF	ECT		
A.K.M. Masood-ul-Alam	150		
A NOTE ON BRANCHED STABLE TWO-DIMENSIONAL MINIMAL SU	IRFACES		
Mario J. Micallef	157		
EXISTENCE OF MINIMAL SURFACES OF BOUNDED TOPOLOGICAL IN THREE-MANIFOLDS	TYPE		
Jon T. Pitts and J.H. Rubinstein	163		
SOME FULLY NON-LINEAR PARABOLIC PARTIAL DIFFERENTIAL EQUATIONS	nen an chuir Air Alla. Na chuir		
S.J. Reye	177		
EXISTENCE OF WILLMORE SURFACES			
Leon Simon	187		
CLASSIFICATION OF MINIMIZING HYPERSURFACES ASYMPTOTITY OUADRATIC CONES IN \mathbb{R}^{n+1}	с		
Leon Simon and Bruce Solomon	217		
OVERDETERMINED SYSTEMS DEFINED BY COMPLEX VECTOR FIELDS			
Francois Treves	224		
REGULARITY OF THE SINGULAR SETS IN IMMISCIBLE FLUID INTERFACES AND SOLUTIONS TO OTHER PLATEAU-TYPE PROBL	EMS		
Brian White	244		
BEST CONTINUITY AT THE BOUNDARY FOR SOLUTIONS OF THE MINIMAL SURFACE EQUATION			
Graham Williams	250		
THE REGULARITY OF WEAK SOLUTIONS TO PARABOLIC SYSTEMS			
Yan Ziqian	256		