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Lecture Notes in Mathematics

Edited by A. Dold and B. Eckmann

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Global Differential Geometry and Global Analysis

Proceedings of the Colloquium Held at the
Technical University of Berlin,
November 21 – 24, 1979

Edited by
D. Ferus, W. Kühnel, U. Simon, and B. Wegner



Springer-Verlag
Berlin Heidelberg New York 1981

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AMS Subject Classifications (1980): 01A xx, 53C xx, 58A xx, 58E xx,
58F xx, 58G xx

ISBN 3-540-10285-X Springer-Verlag Berlin Heidelberg-New York
ISBN 0-387-10285-X Springer-Verlag New York Heidelberg Berlin

Library of Congress Cataloging in Publication Data. Main entry under title: Global differential geometry and global analysis. (Lecture notes in mathematics; 838). Bibliography: p. Includes index. 1. Geometry, Differential—Congresses. 2. Global analysis (Mathematics)—Congresses. I. Ferus, Dirk. II. Series: Lecture notes in mathematics (Berlin); 838. QA3.L28. no. 838. [QA641]. 510s [516.3'62]. 81-263. AACRI

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Printed in Germany

Printing and binding: Beltz Offsetdruck, Hemsbach/Bergstr.
2141/3140-543210

Vorwort

Anlässlich des 150. Geburtsjahres von E. B. Christoffel und des 100-jährigen Bestehens der Technischen Universität Berlin fand vom 21. bis 24. November 1979 am Fachbereich Mathematik der TU Berlin ein Kolloquium über Globale Analysis und Globale Differentialgeometrie statt. Durch die Förderung der Veranstaltung durch die Deutsche Forschungsgemeinschaft, den Deutschen Akademischen Austauschdienst, die Berliner Mathematische Gesellschaft, die Gesellschaft der Freunde der TU Berlin und die Technische Universität wurde mehr als 100 Interessenten aus aller Welt die Teilnahme an diesem Kolloquium ermöglicht.

Der vorliegende Band enthält zum Teil schriftliche Ausarbeitungen von größeren Vorträgen, die auf dem Kolloquium gehalten wurden, sowie ausführliche Arbeiten, die kleinere Vorträge auf dem Kolloquium ergänzen. An den Anfang ist eine Ausarbeitung des Vortrags von K. Leichtweiß über das geometrische Werk von E. B. Christoffel gestellt. Ferner sind in einer gesonderten Sektion Beiträge zusammengestellt, die im Rahmen einer Diskussion über Codazzi-Tensoren vorgelegt wurden.

Den obengenannten Förderern, die die Tagung getragen haben, dem Senator für Wissenschaft und Forschung und der Firma Pravida in Verbindung mit dem Italienischen Generalkonsulat, die Erquickliches zum Rahmenprogramm beigetragen haben, so wie allen, die uns Hilfe bei der Organisation geleistet haben, möchten wir an dieser Stelle danken. Unser Dank gilt insbesondere auch dem Springer-Verlag, der es ermöglicht, den Bericht über das Kolloquium in den Lecture Notes erscheinen zu lassen.

D. Ferus, W. Kühnel, U. Simon und B. Wegner

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Participants of the COLLOQUIUM GLOBAL GEOMETRY/GLOBAL ANALYSIS

TU Berlin, Nov. 1979

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VORTISCH, W.	Germany		

1 - hour - lectures

T. Banchoff	Providence, USA	Mathematical movies
R. Böhme	Erlangen, Germany	Plateau's problem with many solutions
J.P. Bourguignon	Palaiseau, Fr	Ricci curvature and Einstein manifolds
J. Brüning	Duisburg, Germany	Invariant eigenfunctions of the Laplacian and their asymptotic distribution
M. do Carmo	Berkeley, USA	Recent results on minimal sub-manifolds
I. Kolář	Brno, CSSR	Fiber parallelism and connections
O. Kowalski	Prag, CSSR	Additive volume-invariants of Riemannian manifolds
N. Kuiper	Bures-sur-Yvette, Fr	Tight maps
K. Leichtweiß	Stuttgart, Germany	E. B. Christoffels Einfluß auf die Entwicklung der Geometrie
K. Steffen	Düsseldorf, Germany	Singularity-structure of soap-bubbles (with experiments)
S. T. Siu	Stanford, USA	The complex-analyticity of harmonic maps

Short - lectures

St. Alexander	Illinois, USA	Distance geometry in Riemannian manifolds-with-boundary
D. Barthel/ R. Kümriz	Berlin, Germany	Laplacian with a potential
L. Berard Bergery	Nancy, Fr	Laplacian and submersions
R. Bryant	North Carolina, USA	Normal forms of Pfaffian systems
P. Buser	Bonn, Germany	The Bieberbach case in Gromov's almost flat manifold theorem
S. S. Cheng	Princeton, USA	Heat kernel and eigenvalue estimates

T. Cecil	} Worcester, USA	Tight and taut immersions of manifolds in real space forms
P. S. Ryan		
J. Czyż	Warsaw, Poland	Supergeometry in global analysis
A. Derdzinski	Wroclaw, Poland	Compact riemannian manifolds with harmonic curvature and non-parallel Ricci tensor
A. Gray	Maryland, USA	Comparison theorems for the volumes of tubes
K. Grove	Kopenhagen Danmark	Rigidity of positively curved manifolds with large diameter
S. Helgason	Cambridge, USA	The Radon transform, applications and generalizations
T. Ikawa	} Tokyo, Japan	On hypersurfaces with non-negative sectional curvature in a Riemannian manifold of constant curvature
S. Yamaguchi		
H.-Chr. Im Hof	Bern, Switzerland	Visibility, horocycles and the Bruhat decomposition
S. Kobayashi	Berkeley, USA	On holomorphic connections
R. Kulkarni	Bloomington, USA	Klein's G_{168} , Hurwitz '84 (g-1)
R. Langevin	Paris, Fr	Tight foliations
L. Lemaire	La Hulpe, Belg	Existence of harmonic maps between (non-orientable) surfaces
Y. Maeda	Hiroshima, Japan	Canonical forms of pseudo-differential operators
M. P. Malliavin	Paris, Fr	The spectrum of the de Rham-Hodge operator on various homogeneous spaces
H. Matuszczyk	Wroclaw, Poland	On tangent and cotangent bundle of differential space
K. H. Mayer	Dortmund, Germany	S^1 -actions on almost complex manifolds
T. Milnor	New Brunswick, USA	The energy-metric on harmonically immersed surfaces
J. D. Moore	Santa Barbara, USA	Conformal immersions of space forms

W. Mozgawa	Lublin, Poland	Invariant connections of high order and their properties
H.-F. Münzner	Bremen, Germany	Isoparametric hypersurfaces of spheres
V. Oliker	Iowa City, USA	Elliptic operators and hypersurface theory
Z. Olszak	Wroclaw, Poland	Spectrum of the Laplacian and the curvature of Sasakian manifolds
K. Radziszewski	Lublin, Poland	Sur une application de l'espace principal fibré dans son groupe structural
K. Shiohama	Bonn, Germany	A geometric significance of total curvature
T. Sunada	Bonn, Germany	Geodesic chains and spherical means
G. Tsagas	Thessaloniki, Greece	The spectrum of the Laplace operator for a special complex manifold
L. Verstraelen	Leuven, Belg	Hypersurfaces of symmetric spaces
K. Voss	Zürich, Switzerland	Infinitesimal II-bendings of surfaces
P. G. Walczak	Lodz, Poland	Foliations of Riemannian manifolds with minimal leaves
W. Waliszewski	Warsaw, Poland	MacLane-Sikorski's differential spaces
J. Weiner	Honolulu, USA	A uniqueness theorem for submanifolds in euclidean space
I. C. Wood	Leeds, GB	Holomorphicity of minimum energy harmonic maps