

MATHEMATISCHES FORSCHUNGSINSTITUT OBERWOLFACH

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Partial Differential Equations

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August 7th – August 13th, 2011

ABSTRACT. The workshop dealt with partial differential equations in geometry and technical applications. The main topics were the combination of nonlinear partial differential equations and geometric problems, regularity of free boundaries, conformal invariance and the Willmore functional.

Mathematics Subject Classification (2000): 35 J 60, 35 J 35, 58 J 05, 53 A 30, 49 Q 15.

Introduction by the Organisers

The workshop *Partial differential equations*, organised by Luigi Ambrosio (SNS Pisa), Alice Chang (Princeton), Reiner Schätzle (Universität Tübingen), and Georg S. Weiss (University of Tokyo) was held August 7-13, 2011. This meeting was well attended by 52 participants, including 5 females, with broad geographic representation. The program consisted of 17 talks and 6 shorter contributions and left sufficient time for discussions.

New results were presented in geometric measure theory, for example a striking lower bound for the density of singular minimal cones and the regularity of stationary, stable, integral varifolds in codimension 1. Also there were results on singular cones and uniqueness of tangent cones for certain free boundary problems.

Also there were several contributions to regularity of solutions of partial differential equations and to mean curvature flow. We mention a well-posedness result for a critical nonlinear wave equation in two space dimensions.

A major part of the leading experts of partial differential equations with conformal invariance attended the workshop. Here new results were presented in conformal geometry, for the Yamabe problem and the Paneitz operator. For the

Willmore functional, it was established that the Clifford torus minimizes the Willmore energy in an open neighbourhood of conformal classes.

The organisers and the participants are grateful to the Oberwolfach Institute for presenting the opportunity and the resources to arrange this interesting meeting.

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