Preface

Guido Schneider¹

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Hansjörg Geiges presents answers to the question ‘How to Depict 5-Dimensional Manifolds’ and how to use these pictures for answering topological and geometric questions. This survey article is an extended version of what the author has presented at numerous mathematical colloquium lectures.

Under the rubric ‘Classics Revisited’ Reinhard Farwig explains the importance of the work ‘Sur le mouvement d’un liquide visqueux emplissant l’espace.’ by Jean Leray from the year 1934. In this work Leray constructed global (non-unique) weak solutions for the Navier-Stokes equations. One of the million dollar problems of the Clay Mathematics Institute from the year 2000 is the still open question whether the smooth (unique) solutions of the Navier-Stokes equations exist globally in time. But the paper of Leray contains much more. Reinhard Farwig reviews the state of the art of the topics handled in this paper before 1934 and of today.

In their obituary Thomas Bauer, Klaus Hulek, Slawomir Rams, Alessandra Sarti, and Tomasz Szemberg review the scientific life of Wolf Barth (1942–2016). Barth’s famous sextic surface is one of the icons of algebraic surfaces which is illustrated in the IMAGINARY platform. This surface of degree 6 (sextic) was constructed by Wolf Barth in 1996 and has 65 singularities which is the maximal possible number of singularities.

Finally, Michael Struwe presents the book ‘An Introduction to the Theory of Wave Maps and Related Geometric Problems’ by D.-A. Geba and M.G. Grillakis.

We hope you enjoy reading this issue.

✉ G. Schneider
guido.schneider@mathematik.uni-stuttgart.de

¹ Institut für Analysis, Dynamik und Modellierung, Universität Stuttgart, Pfaffenwaldring 57, 70569, Stuttgart, Germany