Hodge Theory and Classical Algebraic Geometry

Conference on
Hodge Theory and Classical Algebraic Geometry
May 13–15, 2013
The Ohio State University, Columbus, Ohio

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## Contents

Preface vii

The stability manifolds of \( \mathbb{P}^1 \) and local \( \mathbb{P}^1 \)
   Aaron Bertram, Steffen Marcus, and Jie Wang 1

Reduced limit period mappings and orbits in Mumford-Tate varieties
   Mark Green and Phillip Griffiths 19

The primitive cohomology of theta divisors
   Elham Izadi and Jie Wang 79

Neighborhoods of subvarieties in homogeneous spaces
   János Kollár 91

Unconditional noncommutative motivic Galois groups
   Matilde Marcolli and Gonçalo Tabuada 109

Differential equations in Hilbert-Mumford Calculus
   Ziv Ran 117

Weak positivity via mixed Hodge modules
   Christian Schnell 129
Preface

This volume contains a selection of papers stemming from the conference *Hodge Theory and Classical Algebraic Geometry*, held on the campus of The Ohio State University in Columbus, Ohio, from May 13 to 15, 2013. The conference web page is still accessible at [http://go.osu.edu/hodge](http://go.osu.edu/hodge). Most of the conference talks were captured on video, which may be viewed by following the appropriate links. A program and abstracts are also available there. In some instances the paper in this volume closely adheres to the conference lecture; in other instances there is a great difference.

The idea of the conference was to offer young researchers a global view of recent developments and to have the speakers share their vision of the future. The papers in this proceeding follow essentially a similar idea; there are a few survey papers while others contain original research. The topics range from more classical aspects of Hodge theory to modern developments in compactifications of period domains, applications of Saito’s theory of mixed Hodge modules, and connections with derived category theory and non-commutative motives.

The reader may note an odd feature: although there is no dedication on the title page, each paper in our volume is dedicated to Professor Herb Clemens. This is because our conference inadvertently used the venerable sales technique known as “bait and switch,” with Clemens as our bait. That is to say: we announced that he was retiring, and that we were organizing a conference in his honor. But it turned out after all that he was not in fact retiring, but instead beginning yet another chapter in his distinguished career.

In view of this history, we tried to enforce the following rule at our conference: you are forbidden to say anything nice about Herb. Of course the rule was skirted repeatedly. One speaker tried to evade it by praising not Herb but rather his basement, where he had stayed as a houseguest while learning to ski in the mountains of Utah. Others broke the rule quite brazenly. For example, it would be violating this rule to remark how much energy he has brought to the Ohio State Mathematics Department and in particular to those who work in algebraic geometry. And again it would be against the rule to note the awe with which we seem to observe at least two or three different people doing full-time jobs, each one of them named Herb Clemens. One of us once had the opportunity to speak to Robert Moses, a civil rights pioneer and the founder of the Algebra Project, who told us of his admiration for Herb’s work in mathematics education, and Moses seemed genuinely astonished to learn that Herb was also famous for a conjecture named after him in pure mathematics. We are very glad to report that his efforts on behalf of mathematics research, education, and infrastructure continue unceasingly.
The conference was supported in part by National Science Foundation Grant No. 1302880, with additional funding provided by The Ohio State University Department of Mathematics, including its Mathematics Research Institute. We used the lecture room and other facilities of the Mathematical Biosciences Institute. The conference organizers were the editors of the present volume, together with Elham Izadi and Christian Schnell, who likewise helped us in preparing the conference grant proposal. Paul Nylander created the striking image used for our poster and conference web pages.

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SELECTED PUBLISHED TITLES IN THIS SERIES

647 Gary Kennedy, Mirel Caibăr, Ana-Maria Castravet, and Emanuele Macrì, Editors, Hodge Theory and Classical Algebraic Geometry, 2015
641 Maria Basterra, Kristine Bauer, Kathryn Hess, and Brenda Johnson, Editors, Women in Topology, 2015
639 C. S. Aravinda, William M. Goldman, Krishnendu Gongopadhyay, Alexander Lubotzky, Mahan Mj, and Anthony Weaver, Editors, Geometry, Groups and Dynamics, 2015
637 Stéphane Ballet, Marc Perret, and Alexey Zaytsev, Editors, Algorithmic Arithmetic, Geometry, and Coding Theory, 2015
636 Simeon Reich and Alexander J. Zaslavski, Editors, Infinite Products of Operators and Their Applications, 2015
635 Christopher W. Curtis, Anton Dzhamay, Willy A. Hereman, and Barbara Prinari, Editors, Nonlinear Wave Equations, 2015
634 Steven Dougherty, Alberto Facchini, André Leroy, Edmund Puczyłowski, and Patrick Solé, Editors, Noncommutative Rings and Their Applications, 2015
632 Gohar Kyureghyan, Gary L. Mullen, and Alexander Pott, Editors, Topics in Finite Fields, 2015
630 Pierre Albin, Dmitry Jakobson, and Frédéric Rochon, Editors, Geometric and Spectral Analysis, 2014
628 Anita T. Layton and Sarah D. Olson, Editors, Biological Fluid Dynamics: Modeling, Computations, and Applications, 2014
627 Krishnaswami Alladi, Frank Garvan, and Ae Ja Yee, Editors, Ramanujan 125, 2014
625 Alexander Barg and Oleg R. Musin, Editors, Discrete Geometry and Algebraic Combinatorics, 2014
623 Pramod N. Achar, Dijana Jakelić, Kailash C. Misra, and Milen Yakimov, Editors, Recent Advances in Representation Theory, Quantum Groups, Algebraic Geometry, and Related Topics, 2014
622 S. Ejaz Ahmed, Editor, Perspectives on Big Data Analysis, 2014
620 Ulrike Tillmann, Søren Galatius, and Dev Sinha, Editors, Algebraic Topology: Applications and New Directions, 2014

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This volume contains the proceedings of a conference on Hodge Theory and Classical Algebraic Geometry, held May 13–15, 2013, at The Ohio State University, Columbus, OH.

Hodge theory is a powerful tool for the study and classification of algebraic varieties. This volume surveys recent progress in Hodge theory, its generalizations, and applications. The topics range from more classical aspects of Hodge theory to modern developments in compactifications of period domains, applications of Saito’s theory of mixed Hodge modules, and connections with derived category theory and non-commutative motives.