

MATHEMATISCHES FORSCHUNGSINSTITUT OBERWOLFACH

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**Mini-Workshop: Algebraic and Analytic Techniques for
Polynomial Vector Fields**

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ABSTRACT. Polynomial vector fields are in the focus of research in various areas of mathematics and its applications. As a consequence, researchers from rather different disciplines work with polynomial vector fields. The main goal of this mini workshop was to create new and consolidate existing interdisciplinary exchange on the subject.

Mathematics Subject Classification (2000): 34, 13A50, 13P, 13N, 37C.

Introduction by the Organisers

The mini workshop was attended by 17 participants, including a post doc from the USA funded by the “US Junior Oberwolfach Fellows” program of the US National Science Foundation.

The mini workshop brought together researchers from various areas of algebra and analysis who work on topics related to polynomial vector fields, and was interdisciplinary in that sense. Many of the participants did not personally know each other prior to the workshop and were also not familiar with all the research areas. Every participant was asked to give a survey talk about their specialty and its relation to the workshop subject. The participants took great care in preparing their talks and made an effort to keep them at a level accessible to a rather general audience while at the same time mentioning interesting recent developments. During each talk and afterwards, there was ample time for questions and a discussion. Additionally, there were several informal problem sessions throughout the week.

Even during the workshop one could see successful interaction as participants were suggesting new approaches or applications for the methods and results presented in the talks. As an example, the existence criterion for algebraically independent first integrals presented in Derksen's talk suggests a way to strengthen a result (due to Pereira) on the extactic of a polynomial vector field as well as additional results in that direction. The relationship of differential Galois theory to the center focus problem was also very interesting. The organisers are confident that the discussions started during the workshop will be continued and lead to fruitful collaborations. Many of the abstracts will be extended to survey articles in a special issue of the journal "Qualitative Theory of Dynamical Systems" and thus become available to a wider audience. To summarize, the workshop has broadened the view and the range of available tools for all participants.