Abstract. The aim of this workshop was to discuss recent developments in several complex variables and complex geometry. Special emphasis was put on the interaction between model theory and the classification theory of complex manifolds. Other topics included Kähler geometry, foliations, complex symplectic manifolds and moduli theory.

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Introduction by the Organisers

The meeting Komplexe Analysis attracted 52 mathematicians from 11 countries. It was the aim of the conference to cover a wide spectrum, thus enabling in particular the younger mathematicians to get an overview of the most recent important developments in the subject. Apart from research-oriented talks the organizers chose to put special emphasis on the subject of “Model Theory and Complex Analysis”. For this purpose three mathematicians mostly working in logic, namely K. Tent, A. Pillay, and B. Zilber, were invited to give two talks each. They gave an introduction to model theory and its applications to complex analysis, in particular highlighting the perspectives opened by this theory in the study of complex manifolds of the Fujiki class $C$, as well as the relationships with certain questions in differential algebra or arithmetic geometry (fields of definition, cycles, Schanuel’s conjecture, etc.). These lectures stimulated a lively discussion.

Several lectures were concerned with recent developments in the study of Kähler geometry and Monge–Ampère equations, in relation with Donaldson’s program or the existence of Kähler–Einstein metrics on Fano manifolds. Eyssidieux explained his recent results on the continuity of solutions of degenerate complex Monge–Ampère equations, based on viscosity techniques. Keller gave an example showing
that balanced metrics may not converge towards constant scalar curvature Kähler metrics, thus considerably refining the depiction of the precise Tian–Donaldson stability conditions which would be needed to warrant the existence of CSCK metrics. Sano presented new results on the calculation of multiplier ideal sheaves which appear as obstructions to the existence of Kähler–Einstein metrics on toric Fano varieties. Schumacher computed the curvature of the higher direct images of relative canonical bundles for deformations of canonically polarized projective varieties, and derived some consequences towards the Shafarevich hyperbolicity conjecture for the corresponding moduli spaces.

There were also other talks, analytic in nature, e.g. in the direction of singularities. Sibony explained his work in complex dynamics, especially his recent results with Dinh and Nguyen on laminations by Riemann surfaces: using heat equation and harmonic current techniques, one can obtain general geometric ergodicity theorems for compact laminations with isolated singularities. Barlet lectured on “themes” of vanishing periods for an isolated singularity, providing new tools to compute monodromy invariants via his theory of \((a,b)\)-modules. Mustaţă presented new deep results in collaboration with M. Jonsson on valuations of function fields and asymptotic invariants of singularities, in relation with the openness conjecture of Demailly-Kollár for singularities of plurisubharmonic functions. Finally Greb considered actions of complex reductive Lie groups on Stein manifolds and reported on joint work with Miebach, establishing a meromorphic quotient in this setup with a very detailed description of the quotient map.

Irreducible symplectic manifolds appeared in two talks: Verbitsky outlined his recent important work on the global Torelli theorem for these manifolds, while Markman presented a proof (joint with Charles) of the standard conjectures for irreducible symplectic manifolds which are deformation equivalent to Hilbert schemes on \(K3\) surfaces. Rigidity theorems for Fano manifolds were the topic of Hwang’s talk. Several talks discussed manifolds with trivial canonical bundle. Prendergast-Smith discussed recent results on the movable cone conjecture for Calabi–Yau manifolds, Halle presented reported on joint work with Nicaise on degenerations of Calabi–Yau manifolds and the motivic monodromy conjecture, and Mukai discussed his recent work on (semi-)symplectic automorphisms of Enriques surfaces and the connection to Mathieu groups. Moduli spaces were the topic of three talks. Van der Geer explained his calculations with Kouvidakis of the class of a certain geometrically interesting divisor on the moduli space of stable curves of even genus, Bauer discussed moduli of Burniat surfaces (joint work with Catanese) and Grushevsky presented results (with Hulek) on the cycle of intermediate Jacobians of cubic threefolds in the moduli space of abelian varieties.

On Tuesday evening young participants (shortly before or after their Ph.D.) were invited to give short presentations of their work. Such presentations were given by M. Gulbrandsen, S. Krug, P. Larsen, and F. Schrack. This session was well attended by the senior participants and led to new contact between younger participants and senior researchers.