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Modulformen

Organised by
Siegfried Böcherer (Mannheim)
Tomoyoshi Ibukiyama (Osaka)
Winfried Kohnen (Heidelberg)

October 28th – November 3rd, 2007

ABSTRACT. The meeting brought together 24 mathematicians working on some of the many aspects of modular forms. The main focus was on holomorphic modular forms (mainly in many variables). This theory is very rich in explicit structures. Central themes were explicit liftings and their properties and the detailed study of modular forms for $GS\!p(4)$, as well as relations to arithmetic and algebraic geometry.

Mathematics Subject Classification (2000): 11xx.

Introduction by the Organisers

The workshop *Modulformen*, organised by Siegfried Böcherer (Mannheim), Tomoyoshi Ibukiyama (Osaka) and Winfried Kohnen (Heidelberg) was held October 28 - November 3, 2007. This meeting was attended by 24 participants with different backgrounds reflecting some of the many aspects of the theory of modular forms. One of the challenging features of this theory is that techniques using Whittaker models do not apply here. On the other hand, the theory is very rich in explicit structures and has immediate connections to arithmetic and geometry.

Some of the main topics (presented in one-hour talks) are

- Maass forms and their role in arithmetic and geometry (Bruinier, Bringman)
- Application to Algebraic Geometry (Dummigan, Yoshida, Gritsenko)
- The fine structure of modular forms for $GS\!p(4)$ (Poor, Wakatski, Roberts, Schmidt)
- Properties of explicit liftings (Panchishkin, Katsurada, Heim, Schulze-Pillot)

The third and fourth topic are not only interesting in their own right but they are also a testing ground for general conjectures. We explicitly mention the theory of newforms by Roberts and Schmidt for $GSp(4)$.

Explicit liftings can be viewed as examples for Langlands functoriality. The emphasis is on the explicit description of these liftings in terms of modular forms (not only representations). A prototype is the Duke-Imamoglu-Ikeda-lifting, which appeared in several talks.

Other talks dealt with theta series, Poincaré series, generation of spaces of modular forms, converse theorems and spherical functions on p -adic spaces. Beyond the talks, there was much opportunity for scientific interaction among the participants.