

# Seminar Algebra und Topologie

Freitag, den 11. Dezember 2009

10.30 Uhr, im kleinen Hörsaal

## Some examples coming from the study of the Danielewski hypersurfaces

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The Danielewski hypersurfaces are the hypersurfaces of  $\mathbb{C}^3$  defined by an equation of the form  $x^n y = Q(x, z)$  where  $n \geq 1$  and  $Q(x, z) \in \mathbb{C}[x, z]$ .

During the past twenty years, their study has led to very nice examples. Notably:

- Smooth affine surfaces  $S_1, S_2$  which are non-isomorphic, whereas the cylinders  $S_1 \times \mathbb{C}$  and  $S_2 \times \mathbb{C}$  are isomorphic;
- Smooth affine surfaces which are algebraically non-isomorphic, but holomorphically isomorphic;
- Non-equivalent embeddings into  $\mathbb{C}^3$ ;
- Polynomials  $P, Q \in \mathbb{C}[x, y, z]$  which are non-equivalent (up to an algebraic automorphism of  $\mathbb{C}[x, y, z]$ ), but when viewed as polynomial of a bigger polynomial ring become equivalent;
- Non-equivalent polynomials  $P, Q$  such that the fibers  $\{P = c\}$  and  $\{Q = c\}$  are isomorphic for each constant  $c \in \mathbb{C}$ .

In this talk we will see some of these phenomena on concrete examples.