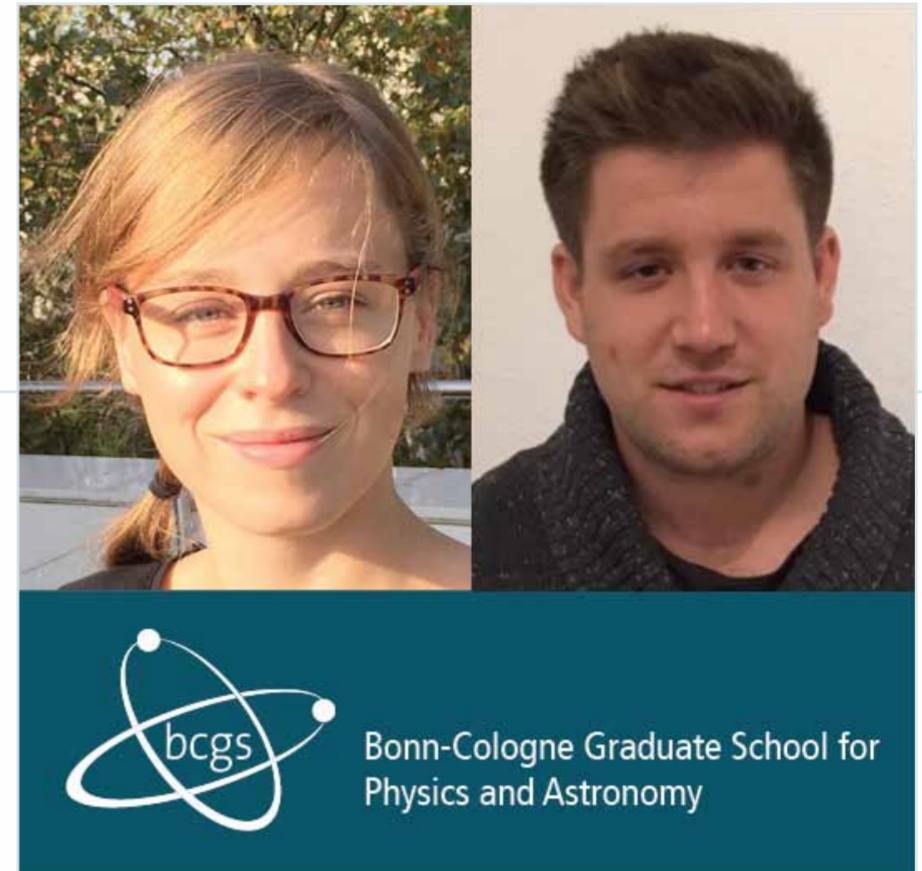


# Großes Physikalisches Kolloquium an der Universität zu Köln

**Nina Müller**  
**Oliver Zingsheim**

Bonn-Cologne Graduate School  
of Physics and Astronomy  
Best Poster Awardees



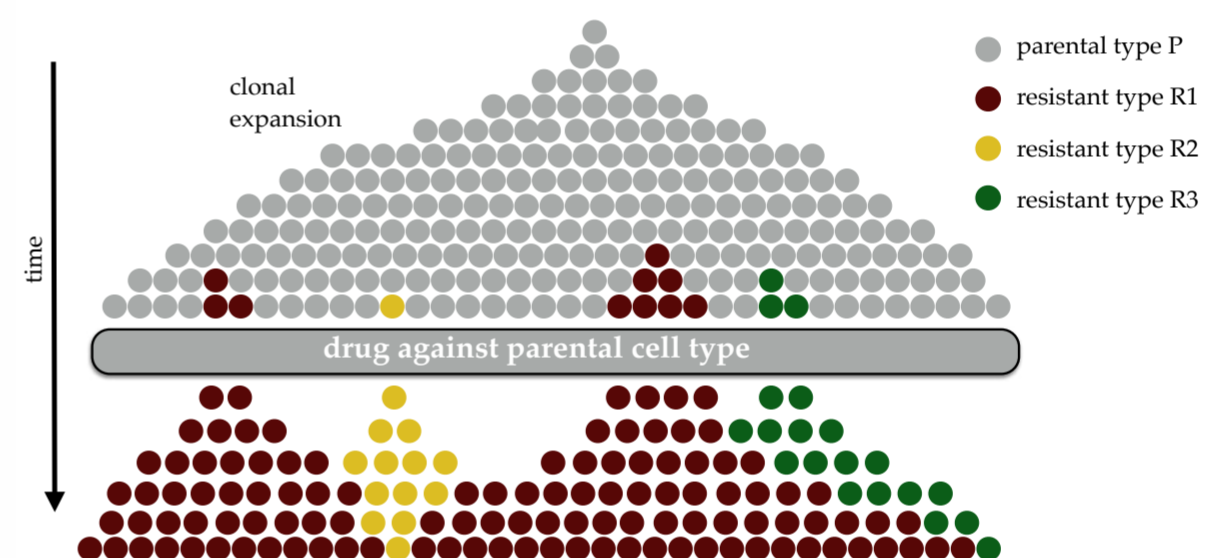
**21.11.2017**  
16<sup>45</sup> Uhr / HS III

## **Cancer evolution and stochastic modeling of resistance to therapy (Nina Müller)**



Cancer is a class of diseases where uncontrolled cell growth leads to the formation of tumors. During the last few decades, there have been huge advances in therapies that exploit the biochemical differences between cancerous and normal cells and are less toxic than classical treatment. But the long-time efficacy of this targeted therapies is limited by the occurrence of resistance which is caused by small resistant sub-populations existing prior to treatment. In my PhD project, I approach the problem of cancer resistance from two

sides: Theoretically, I study the dynamics of rare resistant mutants in a much bigger sensitive population. Experimentally, I isolate all available resistance mechanisms of a cancer cell line in a population of given size. The aim is to better understand the underlying principles of cancer evolution to ultimately improve therapy outcome.



## **Rotational spectroscopy: A powerful analytical tool (Oliver Zingsheim)**

Despite the harsh interstellar environment (UV starlight and fast protons from Supernovae events) almost 200 molecules have been found in space thanks to their “fingerprint”-like rotational spectra. Among them even precursors of life. Such molecules are investigated in the laboratory and illustrative examples are propanal (C<sub>3</sub>H<sub>6</sub>O), a commonplace molecule found on earth and in space, as well as germanium dicarbide (GeC<sub>2</sub>), which has to be created under extreme conditions and –surprisingly– whose structure is under debate for a long time.

