



**Berufungsvorträge**  
**„Mathematische Logik mit Berücksichtigung der Grundlagen der Informatik“**

Die Berufungsvorträge schließen folgende Punkte mit ein:

- Didaktischer Vortrag (25 Minuten)
- Fragen/Pause (10 Minuten)
- Wissenschaftlicher Vortrag (45 Minuten)
- Fragen/Pause (15 Minuten)
- Kommissionelles Hearing -  
(Dekanatsbesprechungszimmer, 11. Stock)

**Montag, 8. Oktober 2018, Hörsaal 11**

**Prof. Alessandra Palmigiano**  
**(Delft University of Technology)**

**14:30 Uhr: Didaktischer Vortrag**

**“Geometry on the phone”**

If you went to school in the pre-smartphone era, you surely have fond recollections of many afternoons spent solving geometry exercises on the phone with your classmates. You had drawn your own picture, and could not see the one of your classmate, but somehow ideas got across all the same, even if you drew your picture with a blotchy pen and no ruler, and your classmate had a perfectly sharp pencil and a ruler. You have surely wondered how it was possible that the differences between the two pictures did not matter, and neither did it matter how accurate they were, as long as they were drawn "in the right way". And how could a certain fact that you discovered working on one particular picture of an isosceles triangle possibly hold for all isosceles triangles? In this lecture, these questions from your teenage years will be answered at long last, and the answer has less to do with geometry than with logic.

**15:05 Uhr: Wissenschaftlicher Vortrag**

**“Logical foundations of categorization theory”**

Categories are the most fundamental cognitive tools humans use to make sense of the world, and interact with it and with each other. They are key to the use of language, the construction of meaning, knowledge and identity, and the formation of agents' evaluations and decisions. While the literature on categorization is expanding rapidly in fields ranging from computational linguistics to social and management science to machine learning and data analysis, the various approaches to categorization are difficult to integrate and compare, and significant insights do not transfer smoothly, even within a single discipline. These same difficulties are present in the extant mathematical approaches to categorization. The main thrust of my present and future research is the creation of novel and unifying logical foundations of categorization theory that adequately capture the essentials of the emerging perspective on categorization: that categories are dynamic, and that their dynamism both results from and shapes processes of social interaction. My methodology is grounded in three interconnected techniques in mathematical logic (unified correspondence, multi-type calculi, and updates on algebras) which I have introduced with my students and collaborators. These techniques bring together algebra, duality theory and proof theory in an innovative way, and used together, make it possible to unify the extant mathematical approaches to categorization, explicitly link them with logic, endow them with the formal machinery to account for the dynamic aspects of categorization, and create an overarching formal environment in which to analyze the dynamics of categories in connection with other relevant aspects of agency and social interaction. This line of research engages with a broad range of cross-disciplinary issues, both theoretical (context-dynamics, self-reinforcing processes, dynamic frame analysis, decision-making under uncertainty, collective decision-making) and real-life (bank runs, deliberation in committees), which will ensure that the new foundations of categorization theory are robust and general, while constantly challenging the limits of extant techniques in mathematical logic.