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MATHEMATIKKOLLOQUIUM

Das Institut für Mathematik lädt zu folgendem Vortrag ein:

Prof. Dr. Alexander Hahn

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Galileo's *Discorsi* and Classical Mechanics in Conflict: The Story of the Problematic Postulate

Because it combines fundamental conceptual insights with mathematics and skillfully constructed experiments, Galileo's study of motion in his *Discourses on Two New Sciences*, published in Leiden 1638. The *Discorsi* is regarded to be of groundbreaking importance in the development of modern classical mechanics. Given the revolutionary nature of this treatise, it is surprising that there is but one major inconsistency with classical mechanics. It has to do with the Postulate

I assume that the degrees of speed acquired by the same moveable over different inclinations of planes are equal whenever the heights of those planes are equal

that Galileo introduced early on *Day Three* of the *Discorsi* as one of the foundational principles of his account of motion. For Galileo, different inclinations of planes apply to the situation where one moveable descends down an inclined plane and the other is in free fall. This case of the Postulate (even though it is presented in the ideal geometric context) provides Galileo with a link between experimentation with inclined planes and the analysis of free fall. This case of the Postulate is also where the difficulty arises. The fact is that it is correct in classical mechanics only if descent down an inclined plane is taken to be ideal slide. However, Galileo's descriptions of descent down inclined planes (in particular his discussion of experiments) refer only to rolling balls and there appears to be no mention of ideal slide in either his published work or in his working papers. Therefore, all indications are that Galileo regards the ideal moveables of his Postulate (and those of its logical consequences) to roll rather than to slide down the plane. With the exception of its inadequate mathematics, this is the most serious problem with the foundational account of motion in the *Discorsi*. The equal speed assertion of the Postulate was a preoccupation for Galileo and it is the purpose of this article to tell its story: How did it occupy Galileo in the early seventeenth century in Pisa? How is it related to an experiment of his contemporary Mersenne? How did Galileo deal with it in the *Dialogo*, the *Discorsi* and thereafter?

Der Vortrag findet in englischer Sprache statt, die anschließende Diskussion wird in deutscher Sprache geführt.

Zeit: **Dienstag, den 26. Mai 2009, um 17¹⁵ Uhr**

Ort: **Viktor-Franz-Hess Haus, Technikerstrasse 25, HS F**

Gäste sind herzlich willkommen!