

# CHARACTER THEORY OF FINITE GROUPS

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SOMMERSEMESTER 2019

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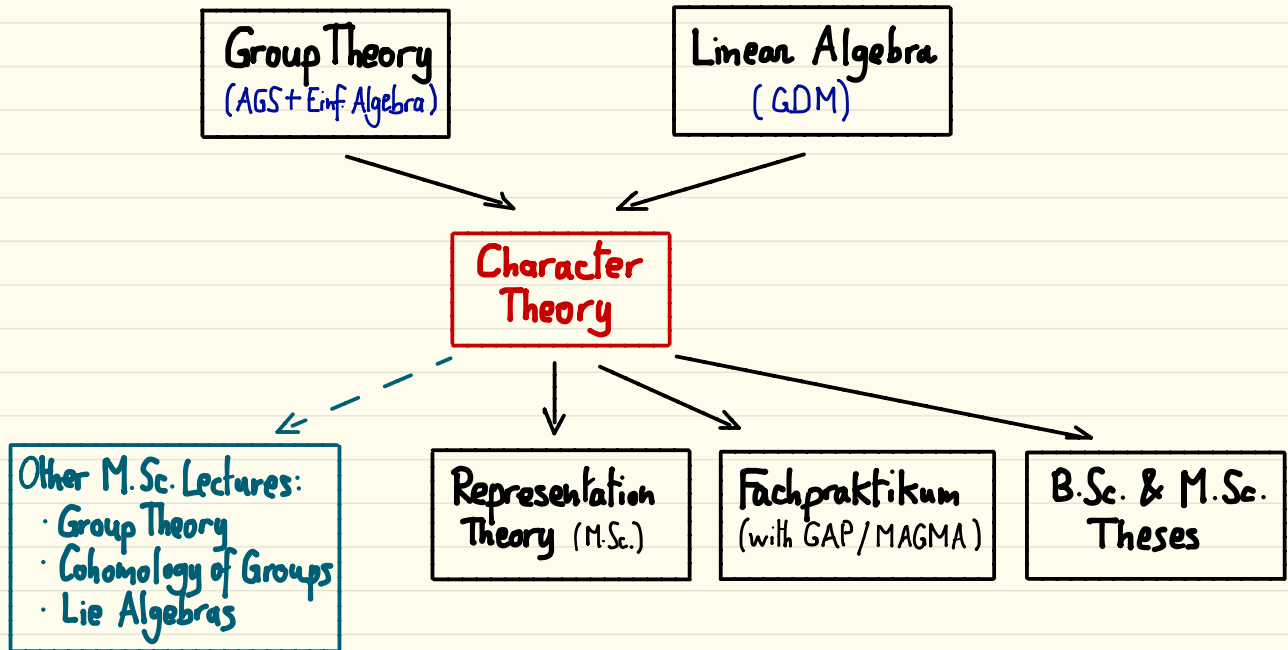
# CHARACTER THEORY OF FINITE GROUPS SS2019

## A. ORGANISATION

- LECTURE: → Tuesdays 10:00 - 11:30 (14x)
- EXERCISES: → Fridays 13:45 - 15:15 (7x). Start: 2<sup>nd</sup> Week
  - Assistant: Bernhard Böhmeler
  - Exercise Sheets: Online: max Wednesdays 14:00  
(every 2<sup>nd</sup> week)
- SCHEINE: To obtain an Übungsschein you need:
  - 50% of the points on the 7 Exercise Sheets altogether
  - 1 point in 2 Exercises out of 4 in each Ex. Sheet 1-7
  - attendance to Exercise Classes + presenting 1 solution on the board.

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## B. BEFORE AND AFTER



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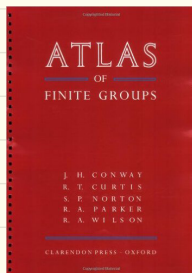
## C. INTRODUCTION

### (1) Character Theory in the 2010 Mathematics Subject Classification



[www.ams.org/msc/msc2010.pdf](http://www.ams.org/msc/msc2010.pdf)

### (2) The ATLAS OF FINITE GROUPS



J.H. CONWAY, R.T. CURTIS, S.P. NORTON, R. PARKER, R.A. WILSON,  
*Atlas of Finite Groups*. Clarendon Press, Oxford, 1985.

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## C. INTRODUCTION

### (3.) Aims of the lecture:

- Character Tables of finite groups:
- What are they?
  - Elementary methods to compute them.
  - What information about finite groups do they contain?
- Give a proof of:

Burnside's  $p^a q^b$ -Theorem: Let  $p, q$  be prime numbers and let  $a, b \in \mathbb{N}_0$ .  
(1911) Then any finite group of order  $p^a q^b$  is soluble.

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## D. PROGRAMME

- I. Linear representations of finite groups
- II. Characters of representations
- III. The character table
- IV. Burnside's  $p^a q^b$ -Theorem
- V. Induction and restriction
- (VI. Brauer's Characterization of characters.) or TBD