



TUM School of Natural Sciences  
Department of Chemistry  
Chair of Physical Chemistry

Technische Universität München



# Bachelorpraktika zur Physikalischen Chemie (5. und 6. Semester)

Vorbesprechung für WiSe 2025/26 – 17.07.2025

**Sebastian Günther, Christopher Stein, Martin Tschurl, Friedrich Esch**

Lehrbereich Physikalische und Theoretische Chemie

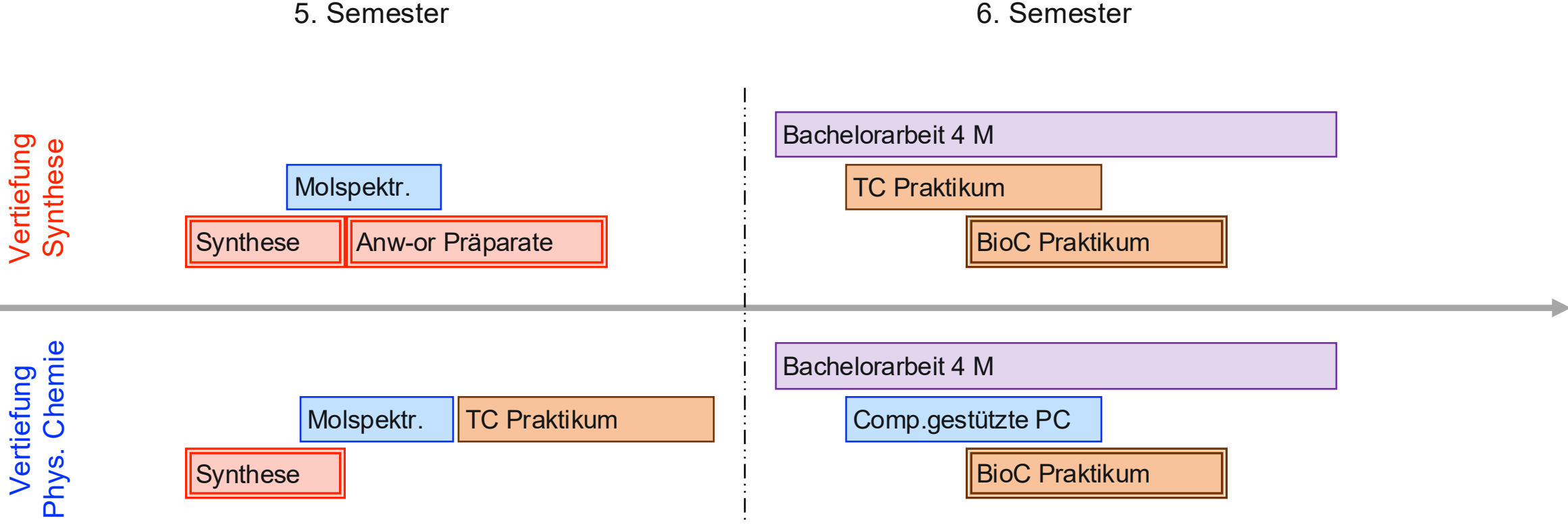
# Studienplan Chemie Bachelor Übersicht (ab WS 2022/23)

|          |   |                                                                                           |                                                                                      |                                                         |                                                                       |                                                                   |                                                                                                                                                     |                                                                  |                                                                                    |                                                                                            |                                                                       |    |   |
|----------|---|-------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------|-----------------------------------------------------------------------|-------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|----|---|
| Semester | 6 | CH0132<br>Organische<br>Synthese<br>(VÜ 5,0 CPs)                                          | CH0124<br>Toxikologie und<br>spezielle<br>Rechtskunde für<br>Chemiker<br>(V 3,0 CPs) |                                                         |                                                                       |                                                                   | <b>Wahlbereich<br/>Vertiefung</b><br>CH4125<br>Fortgeschrittene<br>Arbeitsmethoden:<br>Computergestützte<br>Physikalische<br>Chemie*<br>(P 5,0 CPs) | CH4119<br>Technisch-<br>chemisches<br>Praktikum*<br>(P 5,0 CPs)  | CH4121<br>Biochemisches<br>Praktikum<br>(P 5,0 CPs)                                |                                                                                            | CH4100<br>Bachelors' Thesis<br>(11,0 CPs)                             | 29 | 5 |
|          | 5 | CH4115<br>Fortgeschrittene<br>analytische<br>Verfahren<br>(V 5,0 CPs)                     | CH4116<br>Molekulare<br>Katalyse und<br>Materialchemie<br>(VÜ 5,0 CPs)               | CH4117<br>Biochemie<br>(VÜ 5,0 CPs)                     | CH4118<br>Molekül-<br>spektroskopie<br>(VÜ 5,0 CPs)                   |                                                                   | CH4124<br>Fortgeschrittene<br>Arbeitsmethoden:<br>Anwendungsorienti-<br>erte Präparate*<br>(P 5,0 CPs)                                              |                                                                  | CH4122<br>Fortgeschrittene<br>Arbeitsmethoden:<br>Synthesepraktikum<br>(P 3,0 CPs) | CH4123<br>Fortgeschrittene<br>Arbeitsmethoden:<br>Molekülspektrosko-<br>pie<br>(P 3,0 CPs) |                                                                       | 31 | 7 |
|          | 4 | CH4113<br>Molekulare Struktur<br>und Statistische<br>Mechanik<br>(VÜ 5,0 CPs)             | CH4114<br>Reaktionstechnik<br>und Kinetik<br>(VÜ 5,0 CPs)                            |                                                         |                                                                       |                                                                   | CH4111<br>Anorganisch-<br>chemisches<br>Praktikum 3<br>(PS 5,0 CPs)                                                                                 | CH4112<br>Organisch-<br>chemisches<br>Praktikum<br>(PS 15,0 CPs) |                                                                                    |                                                                                            |                                                                       | 30 | 4 |
|          | 3 | CH4107<br>Anorganische<br>Festkörperchemie<br>und Organo-<br>metallchemie<br>(VÜ 5,0 CPs) | CH0115<br>Reaktivität<br>organischer<br>Verbindungen<br>(VÜ 5,0 CPs)                 | CH4108<br>Quantenmechanik<br>(VÜ 5,0 CPs)               | CH4109<br>Grundlagen der<br>Analytischen<br>Chemie<br>(V 5,0 CPs)     | CH4110<br>Grundlagen der<br>Technischen<br>Chemie<br>(VÜ 5,0 CPs) | CH4106<br>Anorganisch-<br>chemisches<br>Praktikum 2<br>(P 5,0 CPs)                                                                                  |                                                                  |                                                                                    |                                                                                            |                                                                       | 30 | 6 |
|          | 2 | CH0109<br>Aufbau und<br>Struktur<br>organischer<br>Verbindungen #<br>(VÜ 5,0 CPs)         | CH4104<br>Grundlagen der<br>Physikalischen<br>Chemie #<br>(V 5,0 CPs)                | CH4103<br>Anorganische<br>Molekülchemie<br>(VÜ 5,0 CPs) | CH0112<br>Mathematische<br>Methoden der<br>Chemie 2<br>(VÜ 5,0 CPs)   | PH9003<br>Experimental-<br>physik 2<br>(VÜ 4,0 CPs)               | CH4092<br>Grundpraktikum<br>der Anorganischen<br>und Physikalischen<br>Chemie (Teil 2)<br>(P 5,0 CPs)                                               |                                                                  |                                                                                    |                                                                                            |                                                                       | 29 | 6 |
|          | 1 | CH4090<br>Allgemeine und<br>Anorganische<br>Chemie #<br>(VÜ 6,0 CPs)                      |                                                                                      | CH0106<br>Biologie für<br>Chemiker<br>(VÜ 4,0 CPs)      | CH0105<br>Mathematische<br>Methoden der<br>Chemie 1 #<br>(VÜ 5,0 CPs) | PH9002<br>Experimental-<br>physik 1<br>(VÜ 4,0 CPs)               | CH4091<br>Grundpraktikum<br>der Anorganischen<br>und Physikalischen<br>Chemie (Teil 1)<br>(P 5,0 CPs)                                               |                                                                  |                                                                                    | CH0103<br>Programmierung<br>und Data-Science<br>(Ü 4,0 CPs)                                | <b>Wahlbereich<br/>Überfachliche<br/>Grundlagen**<br/>(V 3,0 CPs)</b> | 31 | 7 |

chemisch ----- physikalisch/nat. wiss. ----- Praktika ----- allgemein bildend

Work- Anzahl der  
load Prüfungen

# Wahlmöglichkeit



Block

Spezifische Termine, z.T. wählbar

# Was ist das Praktikum für Molekülspektroskopie?

## Ablauf

Stationenpraktikum mit 4+1 Versuchen in wählbarer Kombination

## Themen

|               |                                                                                                              |
|---------------|--------------------------------------------------------------------------------------------------------------|
| Grundlagen    | Verstehen von Vorgängen in Molekülen                                                                         |
| Anwendungen   | Verwendung dieses Wissens für zeitgemäße Chemie<br>(Analytik, Katalyse, Synthese, Materialcharakterisierung) |
| Zusatzversuch | Diffraktion                                                                                                  |

# Themen: Grundlagen

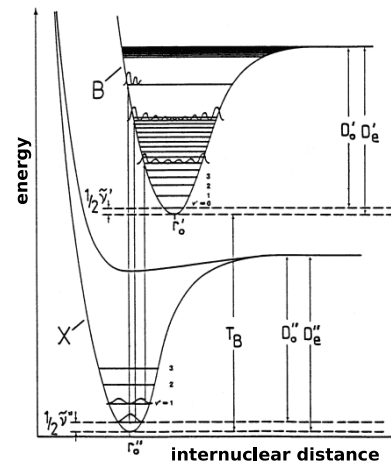
## A01 Photoelektrischer Effekt

Oberflächenspektroskopie von heterog. Katalysatoren (XPS, UPS)



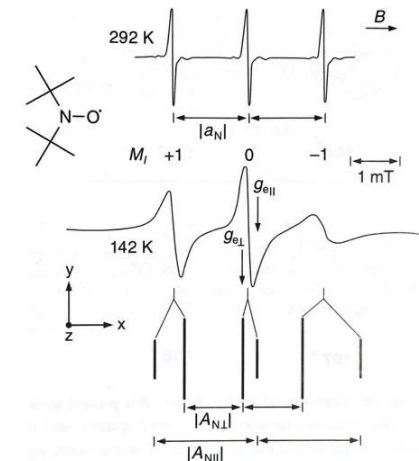
## A02 UV/VIS Spektroskopie

Quantenmechanik angeregter Zustände



## A04 ESR Spektroskopie I

Charakterisierung von Radikalen in Lösung



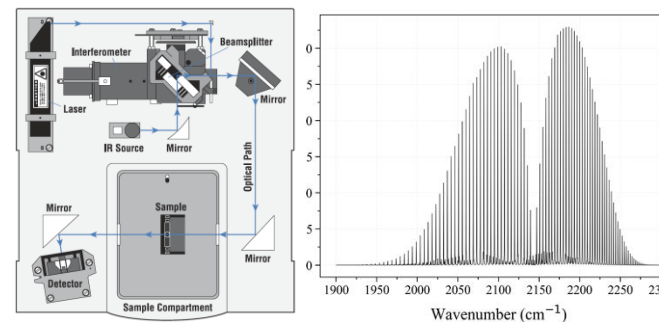
## A06 Fluoreszenzspektroskopie I

Verständnis von Leuchterscheinungen



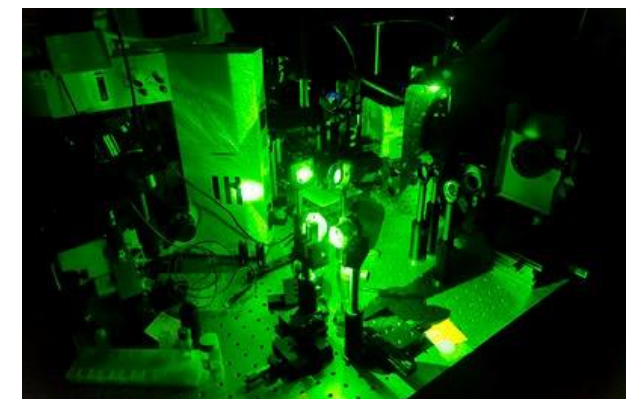
## A09 FT-Infrarotspektroskopie I

Verständnis der IR-Spektren kleiner gasförmiger Moleküle



## A11 Raman-Spektroskopie

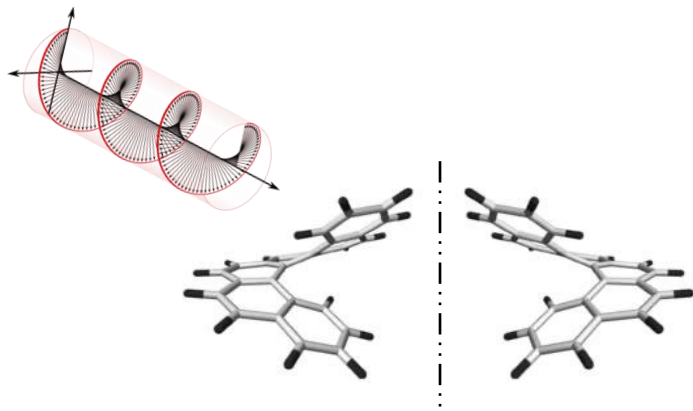
komplementäre Technik zu IR-Sensoren, Mikroskopie



# Themen: Anwendungen

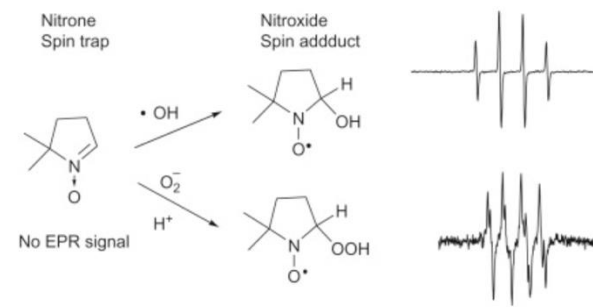
## A03 CD-Spektroskopie

Messen chiraler Verbindungen,  
Bestimmen des EE



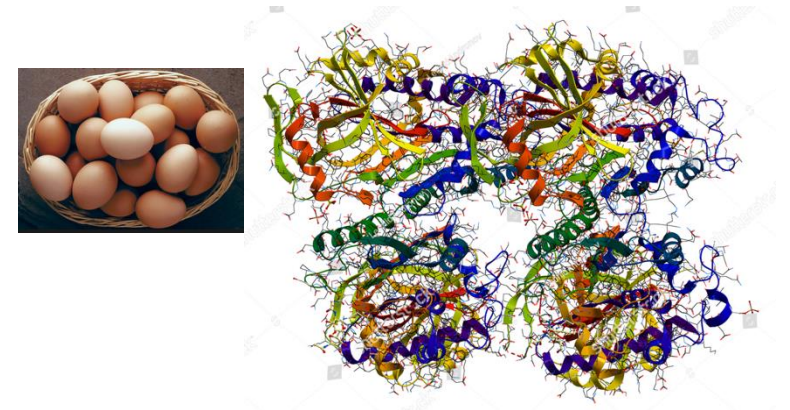
## A05 ESR Spektroskopie II

Messen kurzlebiger Radikal-  
intermediate in Photoreaktionen



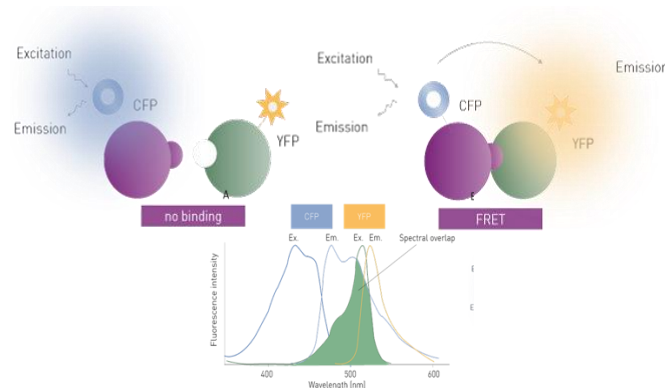
## A07 Fluoreszenzspektroskopie II

Aufklärung der Tertiärstruktur von  
(Bio)-Molekülen



## A08 Fluoreszenzspektroskopie III

Verständnis des Energietransfers  
zwischen Molekülen



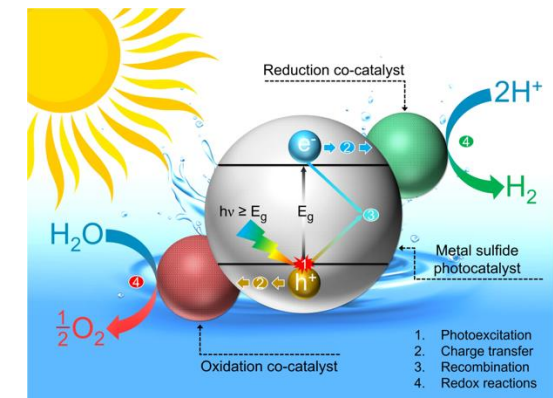
## A10 FT-Infrarotspektroskopie II

Direktes Verfolgen von Reaktionen in  
Lösungen



## A12 Photokatalyse

Licht als Energielieferant für Reaktionen  
(nachhaltige Treibstoffe)



# Ablauf Molekülspektroskopie

| Gruppe | Synth-Block | Versuchsset | Mi, 08.10. M | Mi, 08.10. N | Do, 09.10. M | Do, 09.10. N | Mi, 15.10. M | Mi, 15.10. N | Do, 16.10. M | Do, 16.10. N | Mi, 22.10. M | Mi, 22.10. N | Do, 23.10. M | Do, 23.10. N | Di, 28.10. N | Mi, 29.10. N | Do, 30.10. M | Do, 30.10. N | Mi, 05.11. M | Mi, 05.11. N | Do, 06.11. M | Do, 06.11. N | Mi, 12.11. M | Mi, 12.11. N | Do, 13.11. M | Do, 13.11. N | Mi, 19.11. M | Mi, 19.11. N | Do, 20.11. M | Do, 20.11. N | Mi, 26.11. M | Mi, 26.11. N | Do, 27.11. M | Do, 27.11. N |        |        |     |     |  |
|--------|-------------|-------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------|--------|-----|-----|--|
|        |             |             | Team 1       | Team 1       | Team 1       | Team 1       | Team 2       | Team 2       | Team 2       | Team 2       | Team 1       | Team 1       | Team 1       | Team 1       | Team 2       | Team 2       | Team 2       | Team 2       | Team 2       | Team 2       | Team 2       | Team 2       | Team 1       | Team 1       | Team 1       | Team 1       | Team 2       | Team 2       | Team 2       | Team 2       | Team 1       | Team 1       | Team 1       | Team 1       | Team 1 | Team 1 |     |     |  |
| 1      | Block 1     | Set 1       | A10          |              |              |              |              |              |              |              |              |              | A01          | Team 1       |              |              |              |              |              | Team 2       |              |              |              |              |              |              |              |              | A08          |              |              |              |              |              |        |        |     |     |  |
| 2      | Block 1     | Set 2       | A11          |              |              |              |              |              |              |              |              |              | A02          | Team 1       |              |              |              |              |              |              |              |              |              |              |              |              |              |              | A06          |              |              |              |              |              |        |        |     |     |  |
| 3      | Block 1     | Set 3       | A02          |              |              |              |              |              |              |              |              |              | A10          | Team 1       |              |              |              |              |              |              |              |              |              |              |              |              |              |              | A04          |              |              |              |              |              |        |        |     |     |  |
| 4      | Block 1     | Set 4       | A01          |              |              |              |              |              |              |              |              |              | A11          | Team 1       |              |              |              |              |              |              |              |              |              |              |              |              |              |              | A03          |              |              |              |              |              |        |        |     |     |  |
| 5      | Block 1     | Set 5       | A05          |              |              |              |              |              |              |              |              |              | A07          | Team 1       |              |              |              |              |              |              |              |              |              |              |              |              |              |              | A12          |              |              |              |              |              |        |        |     |     |  |
| 6      | Block 1     | Set 5       | A07          |              |              |              |              |              |              |              |              |              | A05          | Team 1       |              |              |              |              |              |              |              |              |              |              |              |              |              |              | A09          |              |              |              |              |              |        |        |     |     |  |
| 7      | Block 1     | Set 1       |              | A10          |              |              |              |              |              |              |              |              |              | A01          |              |              |              |              |              |              | A03          |              |              |              |              |              |              |              |              |              | A08          |              |              |              |        |        |     |     |  |
| 8      | Block 1     | Set 2       |              | A11          |              |              |              |              |              |              |              |              |              | A02          |              |              |              |              |              |              | A06          |              |              |              |              |              |              |              |              | A04          |              |              |              |              |        |        |     |     |  |
| 9      | Block 1     | Set 3       |              | A02          |              |              |              |              |              |              |              |              |              | A10          |              |              |              |              |              |              | A04          |              |              |              |              |              |              |              |              | A06          |              |              |              |              |        |        |     |     |  |
| 10     | Block 1     | Set 4       |              | A01          |              |              |              |              |              |              |              |              |              | A11          |              |              |              |              |              |              | A08          |              |              |              |              |              |              |              |              | A03          |              |              |              |              |        |        |     |     |  |
| 11     | Block 1     | Set 5       |              | A05          |              |              |              |              |              |              |              |              |              | A07          |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              | A12          |              |              |              |              |        |        |     |     |  |
| 12     | Block 1     | Set 5       |              | A07          |              |              |              |              |              |              |              |              |              | A05          |              |              |              |              |              |              | A12          |              |              |              |              |              |              |              |              | A09          |              |              |              |              |        |        |     |     |  |
| 13     | Block 1     | Set 1       |              |              | A10          |              |              |              |              |              |              |              |              |              | A01          |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              | A08          |              |              |        |        |     |     |  |
| 14     | Block 1     | Set 2       |              |              | A11          |              |              |              |              |              |              |              |              | A02          |              |              |              |              |              |              | A06          |              |              |              |              |              |              |              |              |              | A04          |              |              |              |        |        |     |     |  |
| 15     | Block 1     | Set 3       |              |              | A02          |              |              |              |              |              |              |              |              | A10          |              |              |              |              |              |              | A04          |              |              |              |              |              |              |              |              |              | A06          |              |              |              |        |        |     |     |  |
| 16     | Block 1     | Set 4       |              |              | A01          |              |              |              |              |              |              |              |              | A11          |              |              |              |              |              |              | A08          |              |              |              |              |              |              |              |              |              | A03          |              |              |              |        |        |     |     |  |
| 17     | Block 1     | Set 5       |              |              | A05          |              |              |              |              |              |              |              |              | A07          |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              | A12          |              |              |              |        |        |     |     |  |
| 18     | Block 1     | Set 5       |              |              | A07          |              |              |              |              |              |              |              |              | A05          |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              | A09          |              |              |              |        |        |     |     |  |
| 19     | Block 1     | Set 1       |              |              |              | A10          |              |              |              |              |              |              |              | A01          |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              | A08          |              |              |        |        |     |     |  |
| 20     | Block 1     | Set 2       |              |              |              | A11          |              |              |              |              |              |              |              | A02          |              |              |              |              |              |              | A06          |              |              |              |              |              |              |              |              |              | A04          |              |              |              |        |        |     |     |  |
| 21     | Block 1     | Set 3       |              |              |              | A02          |              |              |              |              |              |              |              | A10          |              |              |              |              |              |              | A04          |              |              |              |              |              |              |              |              |              | A06          |              |              |              |        |        |     |     |  |
| 22     | Block 1     | Set 4       |              |              |              | A01          |              |              |              |              |              |              |              | A11          |              |              |              |              |              |              | A08          |              |              |              |              |              |              |              |              |              | A03          |              |              |              |        |        |     |     |  |
| 23     | Block 1     | Set 5       |              |              |              | A05          |              |              |              |              |              |              |              | A07          |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              | A12          |              |              |              |        |        |     |     |  |
| 24     | Block 1     | Set 5       |              |              |              | A07          |              |              |              |              |              |              |              | A05          |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              | A09          |              |              |              |        |        |     |     |  |
| 25     | Block 2     | Set 1       |              |              |              |              |              |              |              | A03          |              |              |              |              |              |              | A08          |              |              |              |              |              |              | A10          |              |              |              |              |              |              |              |              |              | A01          |        |        |     |     |  |
| 26     | Block 2     | Set 2       |              |              |              |              |              |              |              | A06          |              |              |              |              |              |              | A04          |              |              |              |              |              |              | A11          |              |              |              |              |              |              |              |              |              | A02          |        |        |     |     |  |
| 27     | Block 2     | Set 3       |              |              |              |              |              |              |              |              |              |              |              |              |              |              | A06          |              |              |              |              |              |              | A02          |              |              |              |              |              |              |              |              |              | A10          |        |        |     |     |  |
| 28     | Block 2     | Set 4       |              |              |              |              |              |              |              |              |              |              |              |              |              |              | A03          |              |              |              |              |              |              | A01          |              |              |              |              |              |              |              |              |              | A11          |        |        |     |     |  |
| 29     | Block 2     | Set 5       |              |              |              |              |              |              |              |              |              |              |              |              |              |              | A12          |              |              |              |              |              |              | A05          |              |              |              |              |              |              |              |              |              | A07          |        |        |     |     |  |
| 30     | Block 2     | Set 5       |              |              |              |              |              |              |              |              |              |              |              |              |              |              | A09          |              |              |              |              |              |              | A07          |              |              |              |              |              |              |              |              |              | A05          |        |        |     |     |  |
| 31     | Block 2     | Set 1       |              |              |              |              | A03          |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              | A10          |              |              |              |              |              |              |              |              |              | A01    |        |     |     |  |
| 32     | Block 2     | Set 2       |              |              |              |              | A06          |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              | A11          |              |              |              |              |              |              |              |              |              | A02    |        |     |     |  |
| 33     | Block 2     | Set 3       |              |              |              |              |              | A04          |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              | A02          |              |              |              |              |              |              |              |              |        | A10    |     |     |  |
| 34     | Block 2     | Set 4       |              |              |              |              |              | A08          |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              | A01          |              |              |              |              |              |              |              |              |        | A11    |     |     |  |
| 35     | Block 2     | Set 5       |              |              |              |              |              | A09          |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              | A05          |              |              |              |              |              |              |              |              |        | A07    |     |     |  |
| 36     | Block 2     | Set 5       |              |              |              |              |              | A12          |              |              |              |              |              |              |              |              | A09          |              |              |              |              |              |              |              |              | A07          |              |              |              |              |              |              |              |              |        | A05    |     |     |  |
| 37     | Block 2     | Set 1       |              |              |              |              |              | A03          |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              | A10          |              |              |              |              |              |              |              |              |        | A01    |     |     |  |
| 38     | Block 2     | Set 2       |              |              |              |              |              | A06          |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              | A11          |              |              |              |              |              |              |              |              |        | A02    |     |     |  |
| 39     | Block 2     | Set 3       |              |              |              |              |              |              | A04          |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              | A02          |              |              |              |              |              |              |              |        |        | A10 |     |  |
| 40     | Block 2     | Set 4       |              |              |              |              |              |              | A08          |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              | A01          |              |              |              |              |              |              |              |        |        | A11 |     |  |
| 41     | Block 2     | Set 5       |              |              |              |              |              |              | A09          |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              | A05          |              |              |              |              |              |              |              |        |        | A07 |     |  |
| 42     | Block 2     | Set 5       |              |              |              |              |              |              | A12          |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              | A07          |              |              |              |              |              |              |              |        |        | A05 |     |  |
| 43     | Block 2     | Set 1       |              |              |              |              |              |              | A03          |              |              |              |              |              |              |              | A08          |              |              |              |              |              |              |              |              |              |              |              |              |              | A10          |              |              |              |        |        | A01 |     |  |
| 44     | Block 2     | Set 2       |              |              |              |              |              |              | A06          |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              | A11          |              |              |        |        |     | A02 |  |
| 45     | Block 2     | Set 3       |              |              |              |              |              |              |              | A04          |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              | A02          |              |        |        |     | A10 |  |
| 46     | Block 2     | Set 4       |              |              |              |              |              |              |              | A08          |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              | A01          |              |        |        |     | A11 |  |
| 47     | Block 2     | Set 5       |              |              |              |              |              |              |              | A09          |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              | A05          |              |        |        |     | A07 |  |
| 48     | Block 2     | Set 5       |              |              |              |              |              |              |              | A12          |              |              |              |              |              |              | A09          |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              | A07          |              |        |        |     | A05 |  |

## Themen

A01 Photoelektrischer Effekt - Plancksches Wirkungsquantum und Austrittsarbeit

A02 UV/Vis-Spektroskopie - Vibrationsfeinstruktur Iodmolekül

A03 CD-Spektroskopie - Optische Detektion von Chiralität

A04 ESR-Spektroskopie I - Dynamik von Radikalen in Lösung

A05 ESR-Spektroskopie II - Photochemie mit Spin Traps

A06 Fluoreszenz-Spektroskopie I - Fundamentale Phänomene

A07 Fluoreszenz-Spektroskopie II - Quenching an Biomolekülen

A08 Fluoreszenz-Spektroskopie III - Energietransfer zwischen Molekülen

A09 FTIR-Spektroskopie I - Hochauflösende Gasphasenmessungen

A10 FTIR-Spektroskopie II - in situ ATR-Messungen mit Tauchsonde

A11 Raman-Spektroskopie - Lichtstreuung

A12 Photokatalyse - Katalytischer Abbau an TiO<sub>2</sub>-Nanopartikeln

## Versuchsset

1: A01, A03, A08, A10

2: A02, A04, A06, A11

3: A02, A04, A06, A10

4: A01, A03, A08, A11

5: A05, A07, A09, A12 (2x)

# Ablauf Molekülspektroskopie

| Gruppe | Synth-Block | Versuchsset | Mi, 08.10. M | Mi, 08.10. N | Do, 09.10. M | Do, 09.10. N | Mi, 15.10. M | Mi, 15.10. N | Do, 16.10. M | Do, 16.10. N | Mi, 22.10. M | Mi, 22.10. N | Do, 23.10. M | Do, 23.10. N | Di, 28.10. N | Mi, 29.10. N | Do, 30.10. M | Do, 30.10. N | Mi, 05.11. M |
|--------|-------------|-------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
|        |             |             | Team 1       | Team 1       | Team 1       | Team 1       | Team 2       | Team 2       | Team 2       | Team 2       | Team 1       | Team 1       | Team 1       | Team 1       | Team 2       | Team 2       | Team 2       | Team 2       | Team 2       |
| 1      | Block 1     | Set 1       | A10          |              |              |              |              |              |              |              |              |              | A01          |              |              |              |              |              |              |
| 2      | Block 1     | Set 2       | A11          |              |              |              |              |              |              |              |              |              | A02          |              |              |              |              |              |              |
| 3      | Block 1     | Set 3       | A02          |              |              |              |              |              |              |              |              |              | A10          |              |              |              |              |              |              |
| 4      | Block 1     | Set 4       | A01          |              |              |              |              |              |              |              |              |              | A11          |              |              |              |              |              |              |
| 5      | Block 1     | Set 5       | A05          |              |              |              |              |              |              |              |              |              | A07          |              |              |              |              |              |              |
| 6      | Block 1     | Set 5       | A07          |              |              |              |              |              |              |              |              |              | A05          |              |              |              |              |              |              |
| 7      | Block 1     | Set 1       |              | A10          |              |              |              |              |              |              |              |              |              | A01          |              |              |              |              |              |
| 8      | Block 1     | Set 2       |              | A11          |              |              |              |              |              |              |              |              |              | A02          |              |              |              |              |              |
| 9      | Block 1     | Set 3       |              | A02          |              |              |              |              |              |              |              |              |              | A10          |              |              |              |              |              |
| 10     | Block 1     | Set 4       |              | A01          |              |              |              |              |              |              |              |              |              | A11          |              |              |              |              |              |
| 11     | Block 1     | Set 5       |              | A05          |              |              |              |              |              |              |              |              |              | A07          |              |              |              |              |              |
| 12     | Block 1     | Set 5       |              | A07          |              |              |              |              |              |              |              |              |              | A05          |              |              |              |              |              |
| 13     | Block 1     | Set 1       |              |              | A10          |              |              |              |              |              | A01          |              |              |              |              |              |              |              |              |
| 14     | Block 1     | Set 2       |              |              | A11          |              |              |              |              |              | A02          |              |              |              |              |              |              |              |              |
| 15     | Block 1     | Set 3       |              |              | A02          |              |              |              |              |              | A10          |              |              |              |              |              |              |              |              |
| 16     | Block 1     | Set 4       |              |              | A01          |              |              |              |              |              | A11          |              |              |              |              |              |              |              |              |
| 17     | Block 1     | Set 5       |              |              | A05          |              |              |              |              |              | A07          |              |              |              |              |              |              |              |              |
| 18     | Block 1     | Set 5       |              |              | A07          |              |              |              |              |              | A05          |              |              |              |              |              |              |              |              |
| 19     | Block 1     | Set 1       |              |              |              | A10          |              |              |              |              |              | A01          |              |              |              |              |              |              |              |
| 20     | Block 1     | Set 2       |              |              |              | A11          |              |              |              |              |              | A02          |              |              |              |              |              |              |              |
| 21     | Block 1     | Set 3       |              |              |              | A02          |              |              |              |              |              | A10          |              |              |              |              |              |              |              |
| 22     | Block 1     | Set 4       |              |              |              | A01          |              |              |              |              |              | A11          |              |              |              |              |              |              |              |
| 23     | Block 1     | Set 5       |              |              |              | A05          |              |              |              |              |              | A07          |              |              |              |              |              |              |              |
| 24     | Block 1     | Set 5       |              |              |              | A07          |              |              |              |              |              | A05          |              |              |              |              |              |              |              |
| 25     | Block 2     | Set 1       |              |              |              |              |              |              | A03          |              |              |              |              |              |              | A08          |              |              |              |
| 26     | Block 2     | Set 2       |              |              |              |              |              |              | A06          |              |              |              |              |              |              | A04          |              |              |              |
| 27     | Block 2     | Set 3       |              |              |              |              |              |              | A04          |              |              |              |              |              |              | A06          |              |              |              |
| 28     | Block 2     | Set 4       |              |              |              |              |              |              | A08          |              |              |              |              |              |              | A03          |              |              |              |
| 29     | Block 2     | Set 5       |              |              |              |              |              |              | A09          |              |              |              |              |              |              | A12          |              |              |              |
| 30     | Block 2     | Set 5       |              |              |              |              |              |              | A12          |              |              |              |              |              |              | A09          |              |              |              |
| 31     | Block 2     | Set 1       |              |              |              |              | A03          |              |              |              |              |              |              |              |              |              | A08          |              |              |
| 32     | Block 2     | Set 2       |              |              |              |              | A06          |              |              |              |              |              |              |              |              |              | A04          |              |              |
| 33     | Block 2     | Set 3       |              |              |              |              | A04          |              |              |              |              |              |              |              |              |              | A06          |              |              |
| 34     | Block 2     | Set 4       |              |              |              |              | A08          |              |              |              |              |              |              |              |              |              | A03          |              |              |
| 35     | Block 2     | Set 5       |              |              |              |              | A09          |              |              |              |              |              |              |              |              |              | A12          |              |              |
| 36     | Block 2     | Set 5       |              |              |              |              | A12          |              |              |              |              |              |              |              |              |              | A09          |              |              |
| 37     | Block 2     | Set 1       |              |              |              |              |              | A03          |              |              |              |              |              |              |              |              |              | A08          |              |
| 38     | Block 2     | Set 2       |              |              |              |              |              | A06          |              |              |              |              |              |              |              |              |              | A04          |              |
| 39     | Block 2     | Set 3       |              |              |              |              |              | A04          |              |              |              |              |              |              |              |              |              | A06          |              |
| 40     | Block 2     | Set 4       |              |              |              |              |              | A08          |              |              |              |              |              |              |              |              |              | A03          |              |
| 41     | Block 2     | Set 5       |              |              |              |              |              | A09          |              |              |              |              |              |              |              |              |              | A12          |              |
| 42     | Block 2     | Set 5       |              |              |              |              |              | A12          |              |              |              |              |              |              |              |              |              | A09          |              |
| 43     | Block 2     | Set 1       |              |              |              |              |              |              | A03          |              |              |              |              |              | A08          |              |              |              |              |
| 44     | Block 2     | Set 2       |              |              |              |              |              |              | A06          |              |              |              |              |              | A04          |              |              |              |              |
| 45     | Block 2     | Set 3       |              |              |              |              |              |              | A04          |              |              |              |              |              | A06          |              |              |              |              |
| 46     | Block 2     | Set 4       |              |              |              |              |              |              | A08          |              |              |              |              |              | A03          |              |              |              |              |
| 47     | Block 2     | Set 5       |              |              |              |              |              |              | A09          |              |              |              |              |              | A12          |              |              |              |              |
| 48     | Block 2     | Set 5       |              |              |              |              |              |              | A12          |              |              |              |              |              | A09          |              |              |              |              |

# Ablauf Molekülspektroskopie

**Anmeldung** bis Do, 25.09.2025 in TUMOnline  
 Beginn des Zugangs zu Moodle  
 Einschreibung in fixe Zweiergruppen **vor** Einführung  
 gleicher Block wie in Synth-Praktikum  
 PC-Vertiefer machen TC-Praktikum im WiSe

**Einführung** Mo, 29.09.2025, 14.15-16.00 (CH 26411)  
 sicherheitsrelevant, verpflichtend

8W 1. **A-Versuch** ab 08.10.2025, je 1 halber Tag

2. **A-Versuch**

3. **A-Versuch**

4. **A-Versuch** bis 27.11.2025

Labor  
 Mi, Do 8.00-12.00  
 oder 13.00-17.00

2W **G3 Diffraktion** ab 01.12.2025, 1 NM

**Abschlusskolloquium** 12.-14.01.2026, je 15 Min.

## Moodle

Anleitungen, Tests,  
 Gruppeneinteilung



## Praktikumsserver

Dokumentation,  
 Bewertung

## Termineinteilung

A-Versuche fix  
 G3 Diffraktion Moodle  
 Abschlusskolloquium Moodle

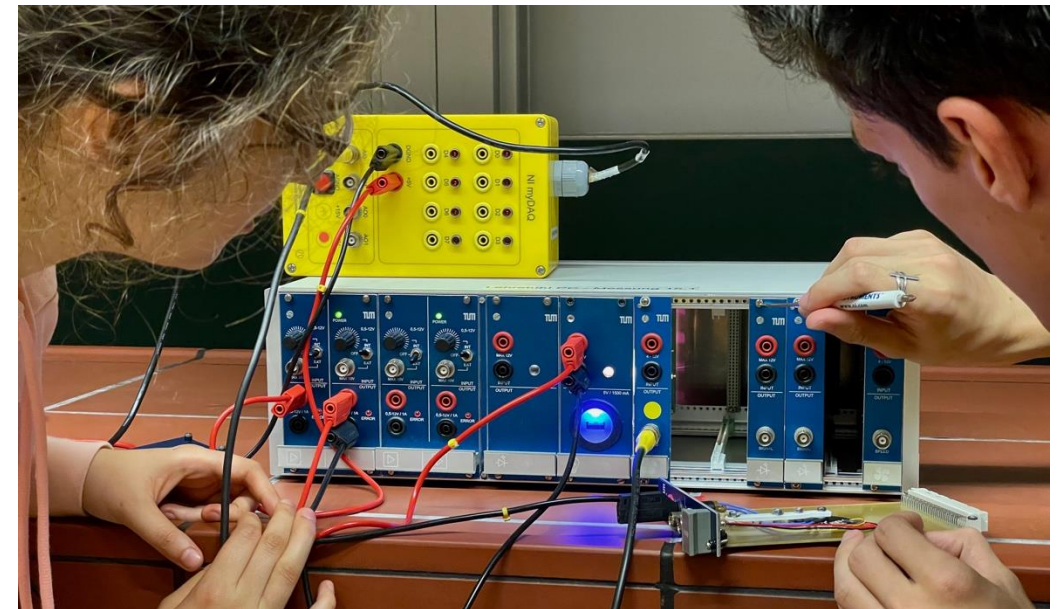
# Was ist das Praktikum zur Computer-gestützten PC?

## Ablauf

Semesterübergreifender Kurs – ca. 8 Wochen (je 2 NM) im CIP-Pool; 5 NM im Labor; 1 Filmfest (Garchingale)

## Themen

1. Computergestützte Datenaufnahme und –ansteuerung
2. Fortgeschrittene Datenauswertung, Programmierung, Simulation
3. Ergebnisoffenes Experimentieren



# Ergebnisoffenes Experimentieren

Orientierung in unwegsamem Gelände ...

e-ink

Geiger-Zähler

Henna redox-flow Batterie

Elektrochrome Scheiben

MRI Mandarine

Cluster-Detektion

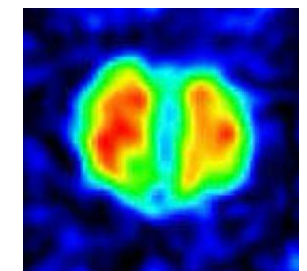
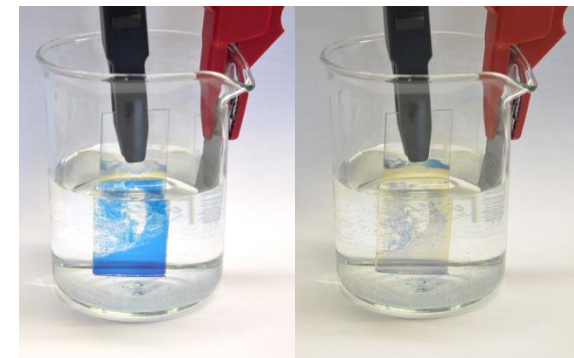
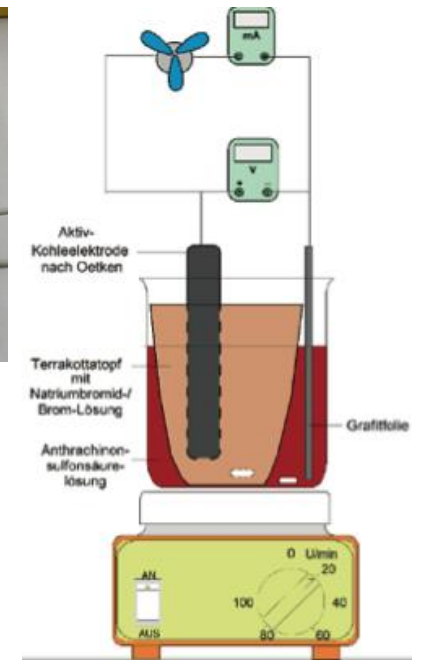
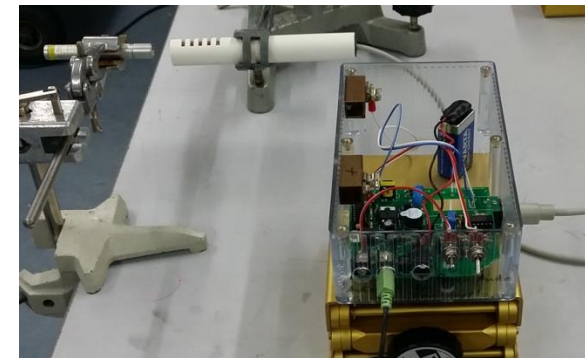
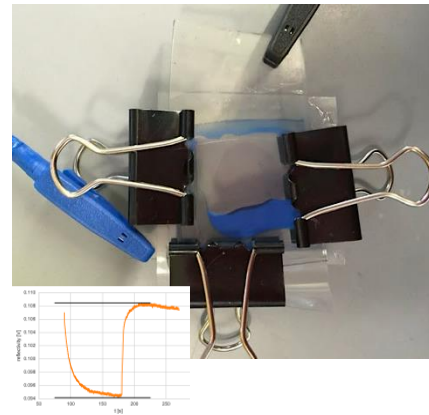
Batterie-Monitoring

Survival Analytics

Feinstaub-Detektoren

Elektronische Laborbücher

Anwendung neuronaler Netze in der Chemie



# Ablauf Computergestützte Phys. Chemie

|                                                                         |
|-------------------------------------------------------------------------|
| <b>Anmeldung</b> bis 1W vor SoSe-Beginn<br>Beginn des Zugangs zu Moodle |
|-------------------------------------------------------------------------|

|    |                                                         |        |
|----|---------------------------------------------------------|--------|
| 5W | <b>Computergestützte Datenaufnahme und -ansteuerung</b> | 2 NM/W |
|----|---------------------------------------------------------|--------|

|    |                                                       |        |
|----|-------------------------------------------------------|--------|
| 5W | <b>Fortgeschrittene Programmierung und Simulation</b> | 2 NM/W |
|----|-------------------------------------------------------|--------|

|    |                                        |      |
|----|----------------------------------------|------|
| 3W | <b>Ergebnisoffenes Experimentieren</b> | 6 NM |
|----|----------------------------------------|------|

|                         |                              |
|-------------------------|------------------------------|
| <b>Abschlusstreffen</b> | Filmfestival am Semesterende |
|-------------------------|------------------------------|

# GARCHINGALE 7

Festival des wissenschaftlichen Screencasts

e r g e b n i s o f f e n

proudly presented by  
the course on computer-based physical chemistry

Donnerstag, 24. Juli 2025, 12.30–18.00

Seminarraum Theorie – CH 63214

Organisation: Friedrich Esch

# Bachelorarbeit

## Wie läuft sie ab?

Gesamtzeitraum 4 Monate – Anmeldung bei Beginn ( $\geq 110$  ECTS), Verlängerung nur in Ausnahmefällen  
Labor 6 ganze Wochen, kann auch verteilt werden in Absprache mit Betreuer

## Ansprechpartner

1. Kontakt mit einem Doktoranden
2. Direkter Kontakt mit Dozenten



Nanoscale NMR  
[Dominik Bucher](#)



Elektrochemie  
[Hubert Gasteiger](#)



PC Katalyse  
[Sebastian Günther](#)



Dyn. Spektroskopie  
[Jürgen Hauer](#)



PC Cluster  
[Ulrich Heiz](#)  
Lehrbereichssprecher



Funktionale  
Nanomaterialien  
[Barbara Lechner](#)



Theoretische  
Chemie  
[Frank Ortmann](#)



Theoretische  
Chemie  
[Christopher Stein](#)



Elektronen-  
mikroskopie  
[Marc-Georg Willinger](#)

## Hilfreiche Informationen

Themen, für die Sie sich besonders interessieren  
Zeitraum für den Beginn der Arbeit



TUM School of Natural Sciences  
Department of Chemistry  
Chair of Physical Chemistry

Technische Universität München



# Bachelorpraktika zur Physikalischen Chemie (5. und 6. Semester)

Vorbesprechung für WiSe 2025/26 – 17.07.2025

**Sebastian Günther, Christopher Stein, Martin Tschurl, Friedrich Esch**

Lehrbereich Physikalische und Theoretische Chemie