

Module Advanced Semiconductors

W. Heiss, P. Wellmann, C. J. Brabec

M1 Modul: Semiconductor: Fundamentals, Characterization, Materials & Processing (W. Heiss)

- [Advanced Semiconductors Introduction: Fundamentals \(Vorlesung, Online\) \(\[HASH\(0x4c70e50\)\]\)](#) (WS 2020/2021)

(Vorlesung, 2 SWS, [Wolfgang Heiß](#), Di, 10:15 - 11:45; Link zur Vorbesprechung: Zoom-Meeting beitreten -

<https://fau.zoom.us/j/95031698298?pwd=NUc3MDZxdmZibFFLRGpyTVltUS9aQT09> Meeting-ID: 950 3169 8298 Kenncode: 046319;

- [Crystal Growth 1 - Fundamentals of Crystal Growth and Semiconductor Technology \(Vorlesung, Online\) \(\[HASH\(0x4c9b168\)\]\)](#) (WS 2020/2021)

(Vorlesung, 2 SWS, [Peter Wellmann](#), jeden Monat am 2. Mo, 14:15 - 15:00, Zoom-Meeting; ab 9.11.2020;

<https://fau.zoom.us/j/94576058631?pwd=QVBOK0N4cVp3cmM1WHdsdUlKUGY3dz09>; Vorbesprechung: 9.11.2020, 14:15 - 15:00 Uhr, Zoom-Meeting)

- [Advanced Semiconductors Introduction: Characterization \(Vorlesung\) \(\[HASH\(0x4cad318\)\]\)](#) (SS 2021)

(Vorlesung, 2 SWS, [Wolfgang Heiß](#), Zeit n.V., 3.71)

- [Crystal Growth - Lab Work 2 Semiconductor Technology \(Praktikum, Online/Präsenz\) \(\[HASH\(0x4c9b168\)\]\)](#) (WS 2020/2021)

(Praktikum, 2 SWS, Anwesenheitspflicht, [Peter Wellmann](#), Do, 8:00 - 17:00, 3.71; Do-Termine entsprechend der Gruppeneinteilung)

M2 Modul: Semiconductor: Devices and Applications (C. J. Brabec)

- [Advanced Semiconductors Introduction: Devices & Applications \(Vorlesung, Online\) \(\[HASH\(0x4c7f7e8\)\]\)](#) (WS 2020/2021)

(Vorlesung, 2 SWS, [Christoph J. Brabec](#), Mi, 17:15 - 18:45; ZOOM-Meetings, ZOOM -Videos im StudOn werden hochgeladen; Vorbesprechung: 4.11.2020, 17:15 - 18:00 Uhr)

- [Lab Work Thin Film Semiconductors \(Praktikum, Online/Präsenz\) \(\[HASH\(0x4ca31f0\)\]\)](#) (SS 2021)

(Praktikum, 2 SWS, Anwesenheitspflicht, [Andres Osvet](#), Zeit n. V., Labore LS i-MEET)

Master Courses in “Crystal Growth & Technology”

1. Fundamentals of Crystal Growth & Semiconductor Technology
(Fundamentals of crystal growth with focus on melt growth, introduction to the processing of Si-based semiconductor devices using planar technology)
P. Wellmann, 2 SWS / 3 ECTS, written exam (pass with 70%)
2. Electronic Devices & Materials Properties / Processing, Epitaxial Growth
(pn-diode, bipolar transistor, Schottky diode, MESFET + MOSFET, interfaces , epitaxial growth, optoelectronic devices based on hetero- and quantum-structures, overview on solar cells)
P. Wellmann, 2 SWS / 3ECTS, written exam (pass with 70%)
3. Wide Bandgap Semiconductors
(Overview on Wide Bandgap Semiconductors with special emphasis on the materials Diamond, SiC, GaN, AlN, ZnSe, ZnO and Ga2O3, doping, polytypism, solution growth, vapor growth)
P. Wellmann, 2 SWS / 2 ECTS, written project work (with grading) of 4 pages in a Journal Style
4. Practical Lab Training
(V.1 Crystal Growth InSb boule by Czochralski OR V.2 Characterization of Semiconductor Wafers)
P. Wellmann + Tutors, 1 experiment (= 2...3 days in the lab) / 2 ECTS, written report (with grading)
5. Numerical Simulation of the Crystal Growth Process using COMSOL Multi-Physics
P. Wellmann + Tutors, 2 SWS training + miniproject (with grading) / 5 ECTS

Module Adv. Semicond. Tech. I: **Solution processed semiconductors**

C. J. Brabec, M. Halik, H.-J. Egelhaaf, W. Heiss

M3/M4/M5/M19/M11 Modul: AST: Solution Processed Semiconductors I – Materials & Nanocrystals (W. Heiss)

- [Advanced Semiconductor Technologies - Materials for Organic Electronics \(Vorlesung, Online\) \(\[HASH\(0x4c63260\)\]\)](#) (WS 2020/2021 - optional)
(Vorlesung, 2 SWS, [Marcus Halik](#), Vorbesprechung: 2.11.2020, 17:00 - 18:00 Uhr)
- [Kolloidale Nanokristalle \(Vorlesung\) \(\[HASH\(0x4ca8b50\)\]\)](#) (SS 2021 - optional)
(Vorlesung, 2 SWS, [Wolfgang Heiß](#), Mo, 10:15 - 11:45, 3.71)
- [Seminar über "Solution Processed Semiconductors" \(Seminar\) \(\[HASH\(0x4caf1d8\)\]\)](#) (WS 2020/2021)
(Seminar, 2 SWS, [Wolfgang Heiß](#), Do, 13:00 - 14:30, Raum n.V.; Raum 16.01.10 EnCN Fürther Str. 250)
- [Advanced Semiconductor Technologies - Synthesis of Carbon Quantum Dots \(Praktikum\) \(\[HASH\(0x4caf1d8\)\]\)](#) (WS 2020/2021)
(Praktikum, 1 SWS, [Wolfgang Heiß](#), Zeit und Raum n.V.)

M3/M4/M5/M19/M11 Modul: AST: Solution Processed Semiconductors II – Processing (H.-J Egelhaaf)

- [Advanced Semiconductor Materials - Excited States and Charge Transport in Organic Semiconductors \(Vorlesung, Online\) \(\[HASH\(0x4c82668\)\]\)](#) (WS 2020/2021)
(Vorlesung, 2 SWS, [Hans-Joachim Egelhaaf](#) et al., Di, 14:15 - 15:45; ab 10.11.2020; Link zur Vorbesprechung: Zoom-Meeting beitreten - <https://fau.zoom.us/j/95031698298?pwd=NUc3MDZxdmZibFFLRGpyTVltUS9aQT09> Meeting-ID: 950 3169 8298 Kenncode: 046319;

- [Advanced Semiconductor Technologies - Processing \(including Lab Work Organic Electronics Processing\) \(Vorlesung mit Übung, Online/Präsenz\) \(\[HASH\(0x4ca6b10\)\]\)](#) (SS 2021)
(Vorlesung mit Übung, 2 SWS, [Hans-Joachim Egelhaaf](#) et al., Zeit n.V., ZOOM oder Online-Übertragung, ZOOM- Videos im StudOn)

M3/M4/M5/M19/M11 Modul: AST: Solution Processed Semiconductors III – Devices (C. J. Brabec)

- [Lab Work Solution Processed Electronics \(Praktikum, Online/Präsenz\) \(\[HASH\(0x4c7a4c0\)\]\)](#) (WS 2020/2021)
(Praktikum, 2 SWS, [Andres Osvet](#), Zeit n. V., Labore LS i-MEET)
- [Advanced Semiconductor Technologies - Solution Processed Devices / Applications \(Vorlesung, Online\) \(\[HASH\(0x4c94700\)\]\)](#) (SS 2021)
(Vorlesung, 2 SWS, [Christoph J. Brabec](#), Zeit n.V., ZOOM oder Online-Übertragung, ZOOM- Videos im StudOn)

Module Adv. Semicond. Tech. II: **Photovoltaic Systems**

C. J. Brabec, M. Halik, H.-J. Egelhaaf, W. Heiss

M3/M4/M5/M19/M11 Modul: AST: Photovoltaic Systems I – PV Fundamentals & Materials (C. J. Brabec)

• [Advanced Semiconductor Technologies - Photovoltaic Systems for Power Generation - Design Implementation and Characterization \(Vorlesung mit Übung, Online\) \(\[HASH\(0x4c88f30\)\]\)](#)

(Vorlesung mit Übung, 2 SWS, [Christoph J. Brabec](#) et al., Di, 17:00 - 18:30; ab 10.11.2020; ZOOM-Meeting, dann ZOOM -Videos im StudOn; Vorbesprechung: 3.11.2020, 17:00 - 18:00 Uhr)

• [Lab Work Characterization and Advanced Defect Imaging of PV Modules and Systems \(Praktikum, Online/Präsenz\) \(\[HASH\(0x4c60d28\)\]\)](#)

(Praktikum, 2 SWS, [Andres Osvet](#) et al., Zeit n. V., Labore LS i-MEET und HIERN)

• [Seminar and Conference Participation on Solar Energy \(Seminar, Online\) \(\[HASH\(0x4cad1c0\)\]\)](#)

(Seminar, 2 SWS, [Ning Li](#) et al., Zeit n.V., additional - ZOOM -Videos im StudOn)

M3/M4/M5/M19/M11 Modul: AST: Photovoltaic Systems II – Light Conversion & Management (M. Batentschuk)

• [Phosphors for Light Conversion in Photovoltaic Devices and LEDs \(Vorlesung, Online\) \(\[HASH\(0x4c80598\)\]\) \(WS 2020/2021\)](#)

(Vorlesung, 2 SWS, [Miroslaw Batentschuk](#), Zeit n.V., ZOOM -Videos im StudOn)

• [Lab Work Manufacturing and Characterization of Phosphors and Storage Phosphors \(Praktikum, Online/Präsenz\) \(\[HASH\(0x4c95cb8\)\]\) \(SS 2021\)](#)

(Praktikum, 2 SWS, [Andres Osvet](#), Zeit n. V., Labore LS i-MEET)

M3/M4/M5/M19/M11 Modul: AST: Photovoltaic Systems III – PV Technology (C. J. Brabec) – in preparation