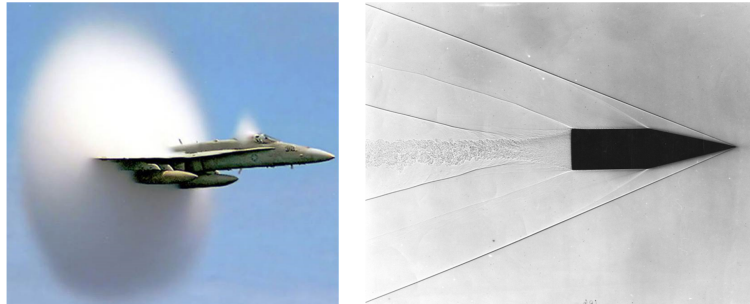


## Lecture Announcement Winter Term 23/24

### Gasdynamics



a) Oblique shock wave at a supersonic aircraft. An expansion upstream of the shock wave results in a decrease in temperature and condensation of water vapour.

b) Shadowgraph of an oblique shock wave originating from the tip of a supersonic projectile.

After attending this module the student will understand state-of-the-art concepts and methods of gasdynamics and its applications in engineering sciences. The student will be in a position to analyse complex problems by selecting an appropriate approach to solving the problem and by applying well established solution methods. Additionally, the student will have the ability to transfer the learned skills into solving new problems.

#### Contents:

- Recapitulation of the basic concepts of fluid mechanics and thermodynamics
- Conservation laws
- Speed of sound and Mach-number
- Normal and oblique shock waves
- Expansion waves
- Lift and drag in supersonic flow
- Method of characteristics
- Compressible potential flow
- Numerical results

**Literature/Teaching Materials:** Manuscripts for lecture and exercise are available in both English and German. Also, the entire module will be made available in German as a video stream via Moodle. Further literature will be recommended during the lecture.

**Prerequisites for Attending:** Fundamental of Fluid Mechanics (Grundlagen der Strömungsmechanik), Thermodynamics, ideally also Advanced Fluid Mechanics (Fortgeschrittene Strömungsmechanik).

**Dates:**  
Lecture: Tuesday, 10:15 – 11:45, IC03/112  
Exercise: Thursday, 10:15 – 11:45, IC03/112  
Revision course: towards the end of the semester

**Start of Lectures :** Tuesday, 17 October 2023, 10:15, IC03/112

**Exam Date and Format:** to be announced, oral exam in English or optionally in German