HSM FAKULTÄT FÜR MASCHINENBAU
LEHRSTUHL FÜR HYDRAULISCHE STRÖMUNGSMASCHINEN
Prof. Dr.-Ing. Romuald Skoda

RUHR UNIVERSITÄT BOCHUM   **RU**B

Lecture Announcement Summer Term 2024

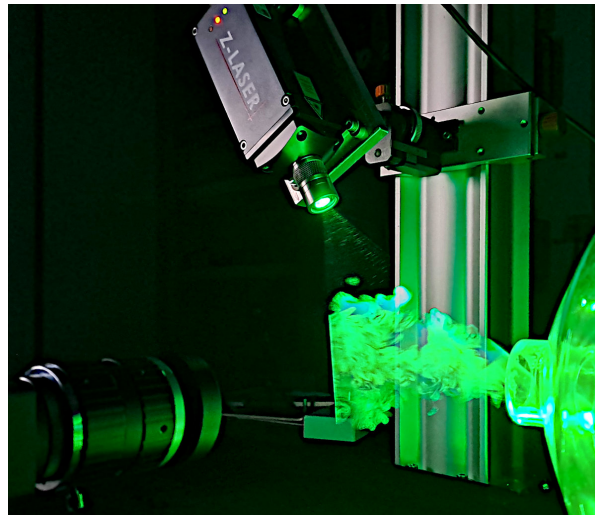# Introduction to Fluid-Flow Measurement Techniques

Figure 1: Measurement setup for planar particle image velocimetry (PIV).

After attending this module the student will understand state-of-the-art concepts and methods of fluid flow measurement techniques and their applications in engineering sciences. The student will be in a position to select an appropriate measurement technique for a given problem. Through mandatory laboratory exercises the student will gain hands-on experience in setting up the measurement system and performing the measurements. Additionally, the student will have the ability to perform a thorough data analysis of the acquired measurement signals including an analysis of the associated measurement uncertainties.

Contents

- Flow visualization techniques (e.g. surface flow visualization, tracer based visualization, optical methods: shadowgraphy, schlieren, interferometry)
- Pressure measurements (e.g. pressure sensors and transducers, surface pressure measurements, pressure probes)
- Velocity measurements (e.g. multi-hole probes, hotwire anemometry, optical methods: Laser-Doppler-Anemometry, Particle-Image-Velocimetry)
- Temperature measurements (e.g. thermocouples, resistance thermometers, surface temperature measurements)
- Signal-/ Data analysis including error analysis
- Test facilities

Literature/Teaching Materials: Manuscripts for lecture and laboratory exercises are available in English. Further literature will be recommended during the lecture.

Dates: Lecture and exercises: Tuesday, 12:15 – 15:45 Uhr, IC03/414.

Start of Lectures: Tuesday, 16 April 2024

Exam Date and Format: to be dated, presentation plus oral exam in English or optionally in German