



Institute of Internal Combustion Engine



1. Description

The Institute of Internal Combustion Engine (ICE) at Shanghai Jiao Tong University (SJTU) was founded in 1954 and is a world-renowned research and educational institution devoted to developing clean and high efficiency solutions for automotive and marine engines. The institute's researches focus on fundamental combustion science, applied combustion engine science and technology and environmental technology, with specific emphasis on combustion theory and diagnostics, advanced engine combustion strategies, supercharging technology, alternative transportation fuels and aftertreatment technology. The institute provides a specialized educational platform for student cultivation in combustion engine research and combustion fundamentals. Students graduated from the institute hold leadership positions in academic and industrial fields. There are currently 9 professors, 12 associate professors and 5 assistant professors working in the institute.

2. Key Research Fields

- Fuel Spray and Atomization
- High Efficiency and Low Emissions Internal Combustion Engines
- Internal Combustion Engines of Alternative Transportation Fuels
- Turbocharging Systems and Technologies for Internal Combustion Engines
- Aftertreatment Technologies for Engine Emissions Control
- PAHs and Soot Particle Formation and Evolution
- Combustion/Catalytic Reaction Kinetics
- Turbulent Combustion/Thermoacoustic Instability
- Photocatalytic Hydrogen Production

3. Labs, Centers and Groups

- Fuel Spray and Combustion Lab
- Advanced Engine Combustion Lab
- Combustion Theory and Diagnosis Lab
- Engine Turbocharging Lab
- Engine Emissions Control Lab
- Environmental Catalysis Lab

4. Instrumentation & Facilities

- Advanced diesel/gasoline engine test benches
- Alternative fuels engine test benches (DME, CNG, Biodiesel, CTL, GTL)
- Diesel engine test platform simulating extreme environmental conditions
- Complex turbocharging system bench for diesel engines
- High-pressure constant volume vessel for fuel spray combustion diagnosis
- Free piston engine test bench
- Rapid compression machine and shock tube for fuel auto-ignition study
- Premixed flame/diffusion flame /turbulent jet flame burners
- Flow reactor for fuel oxidation or pyrolysis
- LIF and LII facilities for PAHs and soot diagnostics
- Multi-physics laser imaging facility for combustion diagnostics
- Mass spectrometry for combustion diagnostics
- Ultrafine particle analysis platform with GC, GC-MS, TGA
- Environmental catalysis platform
- Aftertreatment system test benches (DOC/DPF/SCR/GPF)
- Photocatalytic hydrogen production and CO₂ reduction systems

5. Director

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