

Preface

Special ICE Issue

Almost one and a half centuries since it became a practical reality, the Internal Combustion Engine (ICE) remains today the vastly dominant fuel energy converter in our society. The reasons for the ICE dominance in on and off-road vehicles, railroad, marine, home use, stationary power generation and some aircraft applications are its low specific cost, high power density, robustness, versatility, and fuel flexibility. Indeed, the internal combustion engine has met all performance, fuel economy and emissions requirements to date, and is well matched to available fuels.

Nevertheless, with ever increasing socio-economic pressures for developing yet cleaner and more efficient means for converting the chemical fuel energy into useful work, the ICE is facing emerging competition from hybrid power systems and fuel cells. In response to these new challenges, opportunities lie ahead to enhance dramatically the execution of the fundamental processes in the engine cylinder and to optimize design and system integration to meet new targets. The intensifying global research activities have resulted in a large number of technical papers, presented at the Fall and Spring Technical Conferences organized by the ICE Division of the ASME, which have dealt with both the basic thermo-fluid processes and various aspects of engine design.

This special issue of the *ASME Journal of Engineering for Gas*

Turbines and Power is devoted to a selection of the highest quality papers presented at ASME-ICE meetings, and other papers of long-term reference value, which were submitted directly to the Journal. The papers have been arranged in the following topical areas: Injection and Fuel-Air Mixture Preparation, Auto-ignition and Homogeneous Charge Compression Ignition Engines, Spark Ignition Engine Combustion, Emissions, Manifold Gas Dynamics and Turbocharging, Tribology and Wear. The papers make significant contributions to enhance our understanding of the fundamentals and apply them to design of advanced systems using sophisticated modeling and experimental techniques. The contributions of the authors, the anonymous referees, and the ICE Engine Division Associates, Conference and Session Organizers are gratefully acknowledged.

I want to end this preface with a special word of appreciation and thanks to Lee Langston, our Journal Editor for his encouragement to pursue this worthwhile project, and to Judy Sierant and her ASME staff for working diligently to make this special issue happen.

Dennis N. Assanis

Associate Editor

Internal Combustion Engines