High Pressure Liquid Oxygen Kerosene Engine Combustion

A Vertical Empire provides a description of the British rocketry and space programme from the 1950s to 1970s, detailing the Medium Range Ballistic Missile Blue Streak and its conversion to a satellite launcher as part of the European Launcher Development Organisation (ELDO). This extensively revised second edition includes material only made available in the past ten years and the text is supplemented by numerous photographs, sketches and statistics. The all-British satellite Black Arrow is described, as well as the research rocket Black Knight, the Blue Steel missile and the rocket powered interceptor aircraft.

Committee Serial No. 91-11. Program overview includes texts of government contracts for sale and purchase of helium (p. 9-138).

Investigations of how the global Cold War shaped national scientific and technological practices in fields from biomedicine to rocket science. The Cold War period saw a dramatic expansion of state-funded science and technology research. Government and military patronage shaped Cold War technoscientific practices, imposing methods that were project oriented, team based, and subject to national-security restrictions. These changes affected not just the arms race and the space race but also research in agriculture, biomedicine, computer science, ecology, meteorology, and other fields. This volume examines science and technology in the context of the Cold War, considering whether the new institutions and institutional arrangements that emerged globally constrained technoscientific inquiry or offered greater opportunities for it. The contributors find that whatever the particular science, and whatever the political system in which that science was operating, the knowledge that was produced bore some relation to the goals of the nation-state. These goals varied from nation to nation; weapons research was emphasized in the United States and the Soviet Union, for example, but in France and China scientific independence and self-reliance dominated. The contributors also consider to what extent the changes to science and technology practices in this era were produced by the specific politics, anxieties, and aspirations of the Cold War. Contributors Elena Aronova, Erik M. Conway, Angela N. H. Creager, David Kaiser, John Krige, Naomi Oreskes, George Reisch, Sigrid Schmalzer, Sonja D. Schmid, Matthew Shindell, Asif A. Siddiqi, Zuoyue Wang, Benjamin Wilson

Committee Serial No. 1. Focuses on manned spaceflight programs. Hearing includes NASA "Annual Procurement Report," FY63 (p. 1081-1139), and North American Aviation, Inc. briefing report "Saturn S-II Program," Mar. 10, 1964 (p. 1251-1322),

Annotation Since the invention of the V-2 rocket during World War II, combustion instabilities have been recognized as one of the most difficult problems in the development of liquid propellant rocket engines. This book is the first published in the United States on the subject since NASA's Liquid Rocket Combustion Instability (NASA SP-194) in 1972. In this book, experts cover four major subject areas: engine phenomenology and case studies, fundamental mechanisms of combustion instability, combustion instability analysis, and engine and component testing. Especially noteworthy is the inclusion of technical information from Russia and China--a first.

THE DEFINITIVE INTRODUCTION TO ROCKET PROPULSION THEORY AND APPLICATIONS The recent upsurge in global government and private spending and in space flight events has resulted in many novel applications of rocket propulsion technology. Rocket Propulsion Elements remains the definitive guide to the field, providing a comprehensive introduction to essential concepts and applications. Led by industry veteran George P. Sutton and by Professor Oscar Biblarz, this book provides interdisciplinary coverage including thermodynamics, aerodynamics, flight performance, propellant chemistry and more. This thoroughly revised ninth edition includes discussion and analysis of recent advances in the field, representing an authoritative reference for students and working engineers alike. In any engineering field, theory is only as useful as it is practical; this book emphasizes relevant real-world applications of fundamental concepts to link "thinking" and "doing". This book will help readers: Understand the physics of flight and the chemistry of propulsion Analyze liquid, solid, gas, and hybrid propellants, and the engines they fuel Consider high-temperature combustion, stability, and the principles of electric and chemical propulsion Dissect the workings of systems in common use around the world today Delve into the latest advances in materials, systems, propellants, and more Broad in scope, rich in detail, and clear in explanation, this seminal work provides an unparalleled foundation in aerospace engineering topics. Learning through the lens of modern applications untangles complex topics and helps students fully grasp the intricacies on a more intuitive level. Rocket Propulsion Elements, Ninth Edition merges information and utility building a solid foundation for innovation.

New Scientist magazine was launched in 1956 "for all those men and women who are interested in scientific discovery, and in its industrial, commercial and social consequences". The brand's mission is no different today - for its consumers, New Scientist reports, explores and interprets the results of human endeavour set in the context of society and culture.

The Air Force Research Laboratory (AFRL), in order to support the Evolved Expendable Launch Vehicle (EELV) Program, recently activated a large liquid rocket engine test stand after a 25 years dormancy. Test Stand 1A, located at Edwards AFB CA, was left in a semi-abandoned condition since the early 1970's. With no definitive plans for re-activation, the facility was left to weather in the dry desert air. The objective was to provide the Air Force with the capability to test large liquid rocket engines up to 1.6 million pounds of thrust which utilize liquid oxygen for the oxidizer and either liquid hydrogen or kerosene for fuel. A high pressure hydrogen turbopump spin capability was also added to enable turbopump component development testing. This paper will review the lessons learned and observations from designing, modifying, and activating the test stand and performing the initial development activity on the new RS-68 rocket engine being developed for the Boeing Delta IV launch vehicle.

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This book concentrates on modeling and numerical simulations of combustion in liquid rocket engines, covering liquid propellant atomization, evaporation of liquid droplets, turbulent flows, turbulent combustion, heat transfer, and combustion instability. It presents some state of the art models and numerical methodologies in this area. The book can be categorized into two parts. Part 1 describes the modeling for each subtopic of the combustion process in the liquid rocket engines. Part 2 presents detailed numerical methodology and several representative applications in simulations of rocket engine combustion.

Drawn from early volumes of Aerospace America and its antecedents, this book rescues the insights, concerns, and dreams of dozens of space propulsion experts for the next generation of aerospace scientists and engineers. Written by well-known figures in space propulsion, this book provides readily accessible source material for design courses in astronautical engineering.

Propulsion Techniques surveys the technologies of rocketry in the traditional categories of liquid, solid, hybrid, nuclear, and electric propulsion. Historical trends and cycles are displayed in each category as articles describe concepts and progress from the early visions of Goddard, Oberth, and Tsiolkovsky to proposed (and re-proposed) ideas for advanced space thrusters. In addition to descriptions of rocket engines of various types, associated technologies for propellants and space-electrical power systems are discussed.

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