

Aero Hydrodynamics And The Performance Of Sailing Yachts The Science Behind Sailboats And Their Desi

Beginning with no. 650 each hundredth number contains a list of the Reports and memoranda published since the last list.

This volume offers a selection of the best contributions by Russian scholars--historians and philosophers of science--to the Einstein Studies industry, broadly construed. Most of the papers included here were first published in Russian in the 'Einshteinovskiy Sbornik' series (Einstein Studies), the first of its kind, and initiated in 1966 by Nobel Prize winner Igor Tamm. From 1966-1990, fourteen volumes of the 'Sbornik' were published by Nauka, the chief academic publisher in the former Soviet Union. The book explores such topics as the historical and foundational issues in general relativity and relativistic cosmology, Einstein's contributions to quantum theory of radiation, and the rise of Dirac's quantum electrodynamics. The volume also includes a detailed description of the physics colloquium Einstein established and coordinated in 1912-1914 in Zurich. The contributors draw extensively on documentation previously unavailable to most scholars. Thus the materials from various Russian archives shed new light on the famous exchange (regarding the first evolutionary cosmological models) between Einstein and Aleksandr Friedmann in the early 1920s and on the role of Boris

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Podolsky and Vladimir Fock in the emergence of quantum electrodynamics. The little-known correspondence between Einstein and a famous German pilot Paul Ehrhardt suggests that, during World War I, Einstein was involved with aero- and hydrodynamics and thought about ways of improving airfoil design. Other articles discuss new approaches to important questions in the foundations of general relativity and cosmology. Historians, philosophers, and sociologists of science should be prepared to find much new and unexpected material in this engaging volume presenting the best of the recent Russian scholarship in the field. The book will be accessible to the general reader as well.

Concise text discusses properties of wings and airfoils in incompressible and primarily inviscid flow, viscous flows, panel methods, finite difference methods, and computation of transonic flows past thin airfoils. 1984 edition.

Sail Performance, based on C A Marchaj's classic Sailing Theory & Practice, has established itself as the standard work on the subject and is now acclaimed as a milestone in sailing literature. From wind tunnel tests which he has conducted, Tony Marchaj describes how the factors of wind speed, sail area, sail shape, sail setting, the hull, angle of heel, wind gradient and steadiness of the wind all affect sail power, and why certain rigs are superior in power and efficiency to others. Sail Performance is a major work which is acclaimed for its analysis of the factors that contribute to an efficient sailing rig. 'Should be on the bookshelf of every serious amateur and professional sailor' Nautical

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This definitive text describes the theory and design both of Air Cushion Vehicles (ACV) and Surface Effect Ships (SES). It begins by introducing hovercraft types and their development and application throughout the world in the last three decades, before going on to discuss the theoretical aspects of ACV and SES craft covering their hovering performance, dynamic trim over calm water, resistance, stability, manoeuvrability, skirt configuration and analysis of forces acting on the skirts, ACV and SES seakeeping, and the methodology of scaling aerodynamic and hydrodynamic forces acting on the ACV/SES from model test data. The latter chapters describe a design methodology, including design criteria and standard methods for estimating craft performance, lift system design, skirt design, hull structure, propulsion systems and power unit selection. Much technical information, data, and references to further work on hovercraft and SES design is provided. The book will be a useful reference to engineers, technicians, teachers, students (both undergraduate and postgraduate), operators etc. who are involved in ACV/SES research, design, construction and operation. Guides the reader on how to perform machinery and systems selection within ACV and SES overall design For teachers, students (both at under- and post-graduate level), engineers and technicians involved in ACV/SES

This book presents the state-of-the-art in simulation on supercomputers. Leading researchers present results achieved on systems of the High Performance Computing Center Stuttgart (HLRS) for the year 2010.

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The reports cover all fields of computational science and engineering, ranging from CFD to computational physics and chemistry to computer science, with a special emphasis on industrially relevant applications.

Presenting results for both vector systems and microprocessor-based systems, the book makes it possible to compare the performance levels and usability of various architectures. As HLRS operates the largest NEC SX-8 vector system in the world, this book gives an excellent insight into the potential of vector systems, covering the main methods in high performance computing. Its outstanding results in achieving the highest performance for production codes are of particular interest for both scientists and engineers. The book includes a wealth of color illustrations and tables. Principles of Yacht Design has established itself as the standard book on the subject for practising designers, naval architecture students, discerning boat owners as well as the boatbuilding industry as a whole. The fourth edition is completely revised and expanded and follows the design from scratch of a completely new yacht including all new computer-generated explanatory illustrations. As such, it examines every aspect of the process of yacht and powerboat design. The authors have used a newly designed 41 foot performance cruiser to demonstrate the practical application of yacht design theory. Beginning with the yacht's specifications, the authors examine the vital topics of aero and hydrodynamics and conclude with practical matters such as the layout of the cockpit, deck and cabin, and provide a complete weight calculation for the boat. 'This book is

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deeply fascinating . . . a must.' Classic Boat 'The standard book on the subject for practising designers, naval architecture students, discerning boat owners and the boatbuilding industry as a whole.' Yachting Life (May 2007) 'A definitive work on yacht design.' Cruising

J.M. Burgers (1895--1981) is regarded as one of the leading scientists in the field of fluid mechanics, contributing many important results, a number of which still bear his name. However, the work of this outstanding scientist was mostly published in the Proceedings and Transactions of The Royal Netherlands Academy of Sciences, of which he was a distinguished member. Nowadays, this work is almost impossible to obtain through the usual library channels. Therefore, the editors have decided to reissue the most important work of J.M. Burgers, which gives the reader access to the original papers which led to important results, now known as the Burgers Equation, the Burgers Vector and the Burgers Vortex. Further, the book contains a biography of J.M. Burgers, which provides the reader with both information on his scientific life, as well as a rounded impression of the many activities which J.M. Burgers performed or was involved in outside his science.

Explains the evolution of just about every situation that is likely to be encountered during a race at sea. Each is examined, presenting an overview of the sequence that should take place and its objective, then the task of each crew member is explained for its preparation, operation and completion.

A groundbreaking technical analysis of yacht design based on cutting edge research in the field of aero-hydrodynamics. After nearly losing his life in Africa, retired Army Ranger and historian John Holliday is ready for some R&R back in the U.S. But when a disheveled Russian called Genrikhovich

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intercepts him in the airport, Holliday's homecoming will have to wait. Genrikhovich claims to know of a long-lost sword called Aos-the companion to Holliday's own Templar sword. Holliday quickly finds himself on a flight to Turkey, where he begins following a trail that will lead him to the dark heart of Russia-where the ancient Templar Order has secretly wielded power for centuries...

An autonomous sailboat robot is a boat that only uses the wind on its sail as propelling force, without remote control or human assistance to achieve its mission. This involves autonomy in energy (using batteries, solar panels, turbines...), sensor data processing (compass, GPS, wind sensor...), actuators control (rudder and sail angle control...) and decision making (embedded computer with adequate algorithms). Although robotic sailing is a relatively new field of research, several applications exist for this type of robots: oceanographic and hydrographic research, maritime environment monitoring, meteorology, harbor safety, assistance and rescue in dangerous areas... Over the last decade, several events such as the Microtransat challenge, the WRSC/IRSC and SailBot have been set up to stimulate research and development around robotic sailing. These proceedings cover the current and future academic and technology challenges raised by the development of autonomous sailboat robots presented at the WRSC/IRSC (World Robotic Sailing Championship/International Robotic Sailing Conference) 2013, in Brest, France, 2-6 September 2013.

Some people like to sail. Some people like to sail fast. This is a book about sailing faster. During the past few decades there has been a revolution in the way some boat designers and sailors have thought about, designed, built and sailed their boats. This book is about the new ideas which have led to these greater speeds and the faster sailing techniques

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which have been developed to achieve them. High Performance Sailing has become the standard reference work on high speed racing techniques - the bible for racing sailors, from dinghies right through to America's Cup boats. Ground-breaking in its thinking on boat speed, strategy and tactics, and timeless in its application. Now in its second edition, High Performance Sailing has been brought right up to date with new information, the discoveries from new boat testing and new developments.

High Performance Marine Vessels (HPMVs) range from the Fast Ferries to the latest high speed Navy Craft, including competition power boats and hydroplanes, hydrofoils, hovercraft, catamarans and other multi-hull craft. High Performance Marine Vessels covers the main concepts of HPMVs and discusses historical background, design features, services that have been successful and not so successful, and some sample data of the range of HPMVs to date. Included is a comparison of all HPMVs craft and the differences between them and descriptions of performance (hydrodynamics and aerodynamics). Readers will find a comprehensive overview of the design, development and building of HPMVs.

This book describes and explains the basis of bio-inspired, leading-edge tubercles based on humpback whale flippers as passive but effective flow control devices, as well as providing a comprehensive practical guide in their applications. It first discusses the morphology of the humpback whale flipper from a biological perspective, before presenting detailed experimental and numerical findings from past investigations by various experts on the benefits of leading-edge tubercles and their engineering

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implementations. Leading-edge tubercle designs and functions have attracted considerable interest from researchers in terms of understanding their role in the underwater agility of these whales, and to exploit their flow dynamics in the development of new and novel engineering solutions. Extensive research over the past recent years has demonstrated that the maneuverability of these whales is at least in part due to the leading-edge tubercles acting as passive flow control devices to delay stall and increase lift in the post-stall regime. In addition to the inherent benefits in terms of aerodynamics and hydrodynamics, investigations into leading-edge tubercles have also broadened into areas of noise attenuation, stability and industrial applications. This book touches upon these areas, with an emphasis upon the effects of lifting-surface types, flow regimes, tubercle geometries, lifting-surface stability and potential industrial applications, among others. As such, it features contributions from key experts in the fields of biology, physics and engineering who have conducted significant studies into understanding the various aspects of leading-edge tubercles. Given the broad coverage and in-depth analysis, this book will benefit academic researchers, practicing engineers and graduate students interested in tapping into such a unique but highly functional flow control strategy.

This modern overview to performance analysis

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places aero- and fluid-dynamic treatments, such as cascade and meridional flow analyses, within the broader context of turbomachine performance analysis. For the first time ducted propellers are treated formally within the general family of turbomachines. It also presents a new approach to the use of dimensional analysis which links the overall requirements, such as flow and head, through velocity triangles to blade element loading and related fluid dynamics within a unifying framework linking all aspects of performance analysis for a wide range of turbomachine types. Computer methods are introduced in the main text and a key chapter on axial turbine performance analysis is complemented by the inclusion of 3 major computer programs on an accompanying disc. These enable the user to generate and modify design data through a graphic interface to assess visually the impact on predicted performance and are designed as a Computer Aided Learning Suite for student project work at the professional designer level. Based on the author's many years of teaching at degree level and extensive research experience, this book is a must for all students and professional engineers involved with turbomachinery. This is a groundbreaking, technical book on yacht design linked to the theory (and testing) of how a sailing yacht behaves underway. It is cutting edge in that the conclusions drawn are based on the tank

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testing and wind tunnel testing of models and represents the state of the art in performance prediction which underlies all modern yacht design. This brand new volume from the internationally respected hydrodynamics expert and consultant is bang up to date, with a systematic analysis of how a yacht performs underway.

High speed catamaran and multihull high speed marine vessel have become very popular in the last two decades. The catamaran has become the vessel of choice for the majority of high speed ferry operators worldwide. There have been significant advances in structural materials, and structural design has been combined with higher power density and fuel efficient engines to deliver ferries of increasing size. The multihull has proven itself to be a suitable configuration for active power projection across oceans as well as for coastal patrol and protection, operating at high speedd for insertion or retrieval with a low energy capability. At present there is no easily accessible material covering the combination of hydrodynamics, aerodynamics, and design issues including structures, powering and propulsion for these vehicles. Coverage in High Speed Catamarans and Multihulls includes an introduction to the history, evolution, and development of catamarans, followed by a theoretical calculation of wave resistance in shallow and deep water, as well as the drag components of

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the multihull. A discussion of vessel concept design describing design characteristics, empirical regression for determination of principal dimensions in preliminary design, general arrangement, and methods is also included. The book concludes with a discussion of experimental future vehicles currently in development including the small waterplane twin hull vessels, wave piercing catamarans, planing catamarans, tunnel planing catamarans and other multihull vessels.

The book focuses on the synthesis of the fundamental disciplines and practical applications involved in the investigation, description, and analysis of aircraft flight including applied aerodynamics, aircraft propulsion, flight performance, stability, and control. The book covers the aerodynamic models that describe the forces and moments on maneuvering aircraft and provides an overview of the concepts and methods used in flight dynamics. Computational methods are widely used by the practicing aerodynamicist, and the book covers computational fluid dynamics techniques used to improve understanding of the physical models that underlie computational methods. How and why does sail boat performance depend on the configuration and trim of boat and sails? This book provides the yachtsman with answers in a relatively straightforward account of the physical mechanisms of sailing. It presents an accessible

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overview of the fluid dynamic aspects of sailing and sailing technology, addressing both aeromechanics and hydromechanics. Readers are provided with the basic principles of physics and general mechanics that will assist their understanding of the fluid mechanics of sailing yachts. Rich appendices cover not only in-depth, mathematical-physical treatments and derivations for those wishing to explore further, but also helpful summaries of basic mathematical notions for those wishing to refresh their knowledge. This work explores keel yachts, specifically single-masted mono-hulls with 'fore-and-aft', Bermuda-rigged sails. However, much of it is applicable to other types of sailing vessels such as multi-hulls, yachts with multiple masts, windsurf boards and the like. Yachtsmen, yacht designers and professionals of sailing technology will all find something of interest in this work which provides explanations of the mechanics of sailing in a way that is scientifically justified, whilst remaining appealing to those wishing to use their knowledge on-board a sailing vessel. For some years I'm teaching a course on "Sailing Yacht Design" in the master class of yacht design. Actually, I've found your book the best one about physics of a sailing yacht I've ever read. Edward Canepa, assistant professor in Fluid Machinery at the University of Genova (Italy) ...very impressed, no wonder it took so long. It is "everything I ever wanted to know about sailing but was afraid to ask" !

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Frank Woodward, former computational fluid dynamicist at the Boeing Company and Analytical Methods Inc., and a cruising yachtsman

Why must a boat make leeway in order to sail to windward? How can a helmsman prevent downwind rolling? Why is a sail able to produce a force at right angles to the wind direction? These and many other important questions are addressed by the authors in this detailed study of the motive forces of a yacht. This is a book about spectral methods for partial differential equations: when to use them, how to implement them, and what can be learned from their of spectral methods has evolved rigorous theory. The computational side vigorously since the early 1970s, especially in computationally intensive of the more spectacular applications are applications in fluid dynamics. Some of the power of these discussed here, first in general terms as examples of the methods have been methods and later in great detail after the specifics covered. This book pays special attention to those algorithmic details which are essential to successful implementation of spectral methods. The focus is on algorithms for fluid dynamical problems in transition, turbulence, and aero dynamics. This book does not address specific applications in meteorology, partly because of the lack of experience of the authors in this field and partly because of the coverage provided by Haltiner and Williams (1980). The success of spectral methods in practical computations has led to an increasing interest in their theoretical aspects, especially

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since the mid-1970s. Although the theory does not yet cover the complete spectrum of applications, the analytical techniques which have been developed in recent years have facilitated the examination of an increasing number of problems of practical interest. In this book we present a unified theory of the mathematical analysis of spectral methods and apply it to many of the algorithms in current use.

This book analyses and comprehensively explains the necessary factors for designing and implementing PIV systems that achieve reliable, accurate, and fast measurements.

This proceedings put together 68 selected articles from the joint conferences of 2014 Congress on Industrial Engineering, Machine Design and Automation (IEMDA2014) and the 2nd Congress on Computer Science and Application (CCSA2014), held in Sanya, China during December 12 - 14, 2014. The conference program of IEMDA 2014 focused on areas of Industrial Engineering, Machine Design and Automation, while the CCSA 2014 program provided the platform for Computer Science and Applications. Collected together the latest research results and applications on industrial engineering, machine design, automation, and computer science and other related Engineering topics. All submitted papers to this proceedings were subjected to strict peer-reviewing by 2-4 expert referees, to ensure that all articles selected are of highest standard and are relevance to the conference.

Fully updated, this authoritative and richly illustrated standard reference offers the latest information on rig

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design, sail construction and trim, wind-sail interaction, and the structure of the wind. From his 40 years of research and wind-tunnel tests, acknowledged expert Marchaj describes how these factors affect sail power and why certain rigs are superior in power and efficiency. Accessible and nonmathematical, this major work represents the cutting-edge wisdom on sailboat performance and makes a significant contribution to our understanding of this absorbing, complex subject. Jim Saltonstall has coached multiple National, European, World and Olympic racing champions, including Ben Ainslie, one of Britain's most successful Olympians. This quick reference handbook distills the wisdom of 40 years in the business to help all dinghy, yacht and windsurfers to improve their performance in one of the most challenging sports in the world. The book tackles all the issues that can arise at any point on the racecourse, from the starting line to the first mark to the finish line. It explains how to prepare for a race and how to get the best out of the boat in an accessible format (bite sized advice, tips and wisdom) and with an encouraging approach, offering intelligent analysis peppered with Jim's trademark sense of humour. Featuring photographs that illustrate specific aspects of all races and a checklist of all the key issues racers need to think about as they progress around the course, this book should be in every would-be champion's kitbag, both on and off the water. Endorsed by Ben Ainslie and with a foreword by Olympic gold medal-winner Iain Percy. Wind Turbines and Aerodynamics Energy Harvesters not only presents the most research-focused resource on

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aerodynamic energy harvesters, but also provides a detailed review on aeroacoustics characteristics. The book considers all developing aspects of 3D printed miniature and large-size Savonious wind harvesters, while also introducing and discussing bladeless and aeroelastic harvesters. Following with a review of Off-shore wind turbine aerodynamics modeling and measurements, the book continues the discussion by comparing the numerical codes for floating offshore wind turbines. Each chapter contains a detailed analysis and numerical and experimental case studies that consider recent research design, developments, and their application in practice. Written by an experienced, international team in this cross-disciplinary field, the book is an invaluable reference for wind power engineers, technicians and manufacturers, as well as researchers examining one of the most promising and efficient sources of renewable energy. Offers numerical models and case studies by experienced authors in this field Contains an overview and analysis of the latest research Explores 3D printing technology and the production of wind harvesters for real applications Includes, and uses, ANSYS FLUENT case files

The Psychology of Racing for Dinghies and Keelboats is an inspirational practical guide to mind training for racing sailors. Aimed at aspiring dinghy sailors as well as yacht racers, the style is light, friendly and conversational - designed to inspire, guide and promote positive analytical thinking amongst racers of all levels, with the aim of helping them find the inner resolve and mental strength required to be a winner. Packed with tables, tick

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boxes and exercises as well as thought-provoking quotes from successful international sailors, it is delightfully free of psychobabble and tedious theory - a really practical guide that will be invaluable to all racers of all levels and abilities.

Master simple to advanced biomaterials and structures with this essential text. Featuring topics ranging from bionanoengineered materials to bio-inspired structures for spacecraft and bio-inspired robots, and covering issues such as motility, sensing, control and morphology, this highly illustrated text walks the reader through key scientific and practical engineering principles, discussing properties, applications and design. Presenting case studies for the design of materials and structures at the nano, micro, meso and macro-scales, and written by some of the leading experts on the subject, this is the ideal introduction to this emerging field for students in engineering and science as well as researchers.

The marine environment presents significant challenges for materials due to the potential for corrosion by salt water, extreme pressures when deeply submerged and high stresses arising from variable weather. Well-designed fibre-reinforced composites can perform effectively in the marine environment and are lightweight alternatives to metal components and more durable than wood. *Marine Applications of Advanced Fibre-Reinforced Composites* examines the technology, application and environmental considerations in choosing a fibre-reinforced composite system for use in marine structures. This book is divided into two parts. The chapters in Part One explore the manufacture,

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mechanical behavior and structural performance of marine composites, and also look at the testing of these composites and end of life environmental considerations. The chapters in Part Two then investigate the applications of marine composites, specifically for renewable energy devices, offshore oil and gas applications, rigging and sails. Underwater repair of marine composites is also reviewed. Comprehensively examines all aspects of fibre-reinforced marine composites, including the latest advances in design, manufacturing methods and performance Assesses the environmental impacts of using fibre-reinforced composites in marine environments, including end of life considerations Reviews advanced fibre-reinforced composites for renewable energy devices, rigging, sail textiles, sail shape optimisation and offshore oil and gas applications

This book gathers a selection of papers presented at ROBOT 2019 – the Fourth Iberian Robotics Conference, held in Porto, Portugal, on November 20th–22nd, 2019. ROBOT 2019 is part of a series of conferences jointly organized by the SPR – Sociedade Portuguesa de Robótica (Portuguese Society for Robotics) and SEIDROB – Sociedad Española para la Investigación y Desarrollo en Robótica (Spanish Society for Research and Development in Robotics). ROBOT 2019 built upon several previous successful events, including three biannual workshops and the three previous installments of the Iberian Robotics Conference, and chiefly focused on presenting the latest findings and applications in robotics from the Iberian Peninsula, although the event

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was also open to research and researchers from other countries. The event featured five plenary talks on state-of-the-art topics and 16 special sessions, plus a main/general robotics track. In total, after a stringent review process, 112 high-quality papers written by authors from 24 countries were selected for publication. Authoritative, highly readable history of aerodynamics and the major theorists and their contributions. Practical Ship Hydrodynamics provides a comprehensive overview of hydrodynamic experimental and numerical methods for ship resistance and propulsion, maneuvering, seakeeping and vibration. Beginning with an overview of problems and approaches, including the basics of modeling and full scale testing, expert author Volker Bertram introduces the marine applications of computational fluid dynamics and boundary element methods. Expanded and updated, this new edition includes: Otherwise disparate information on the factors affecting ship hydrodynamics, combined to provide one practical, go-to resource. Full coverage of new developments in computational methods and model testing techniques relating to marine design and development. New chapters on hydrodynamic aspects of ship vibrations and hydrodynamic options for fuel efficiency, and increased coverage of simple design estimates of hydrodynamic quantities such as resistance and wake fraction. With a strong focus on essential background for real-life modeling, this book is an ideal reference for practicing naval architects and graduate students.

The Twenty-Second Symposium on Naval

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Hydrodynamics was held in Washington, D.C., from August 9-14, 1998. It coincided with the 100th anniversary of the David Taylor Model Basin. This international symposium was organized jointly by the Office of Naval Research (Mechanics and Energy Conversion S&T Division), the National Research Council (Naval Studies Board), and the Naval Surface Warfare Center, Carderock Division (David Taylor Model Basin). This biennial symposium promotes the technical exchange of naval research developments of common interest to all the countries of the world. The forum encourages both formal and informal discussion of the presented papers, and the occasion provides an opportunity for direct communication between international peers.

Prandtl was one of the great theorists of aerodynamics and this work has long been considered one of the finest introductory works in the field. Topics include flow through pipes, Prandtl's own work on boundary layers, drag, airfoil theory, and entry conditions for flow in a pipe.

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